Freight Progress In War Number

JUN 3 1942

May 23, 1942

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# Railway Age

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## THREE FOR V

WHAT does it take to move a million tons of freight a mile every minute—as the American railroads are doing?

What does it take to have cars, when and where they're needed—so that every minute a dozen different freight trains start out on their runs?

It takes good equipment, skilled man power and efficient management.

It takes the full, three-way cooperation of those who ship goods, of the railroads which haul them, and of those who receive them.

It's up to the shipper to load his cars to capacity as soon as he gets them. It's up to the railroads to speed them to their destination. And it's up to the receiver to unload right away and see that no cars are used for storage purposes.

Such teamwork as this has enabled the railroads to handle the greatest transportation job in history. How much more they can do depends upon the materials they are permitted to get for repair and maintenance, and for additional cars and locomotives.

Whatever that may be, the railroads, the shippers and the receivers—THREE FOR V—will work together to help win this war.

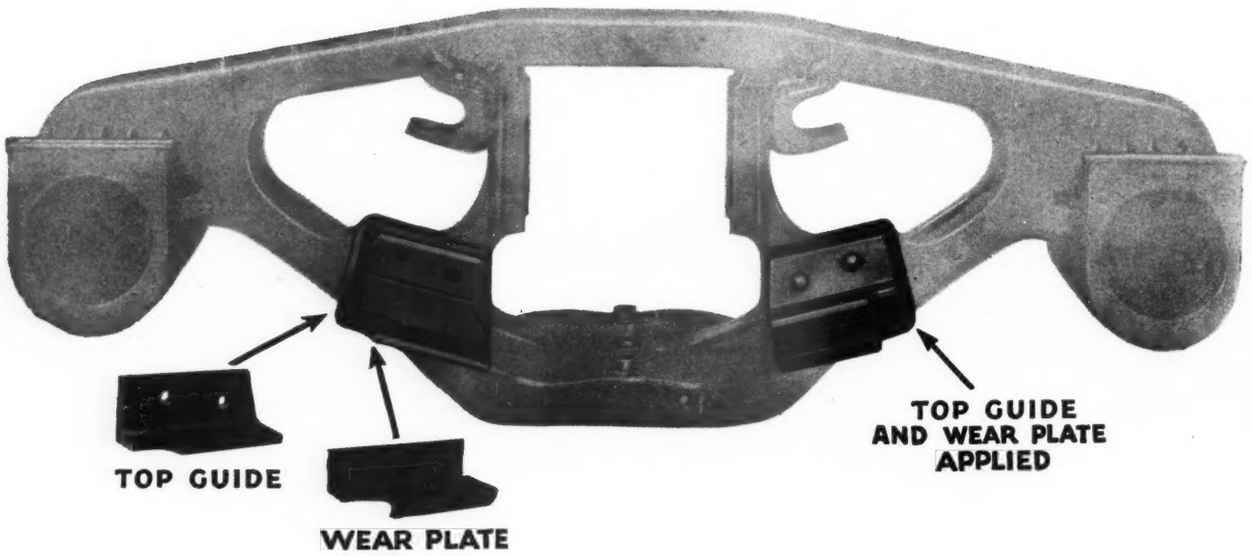
ASSOCIATION OF

**AMERICAN RAILROADS**

WASHINGTON, D. C.

# UNIT TRUCK

## The greatest advancement in

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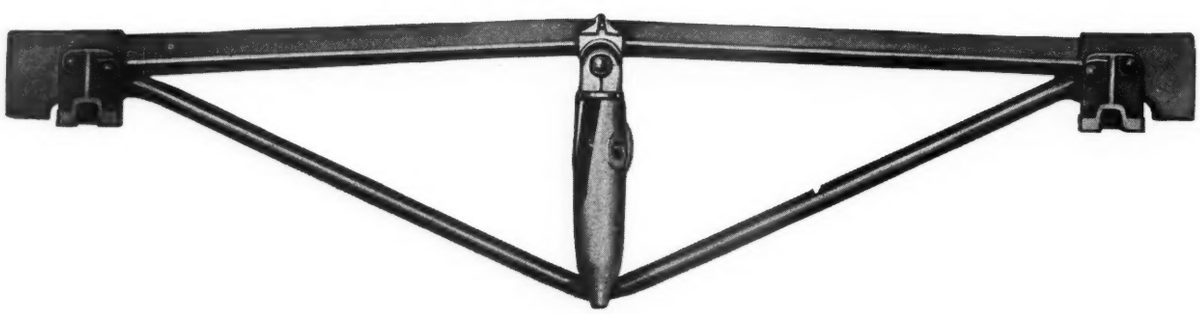

## UNIT TRUCK CORPORATION

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Vol. 112 May 23, 1942 No. 21


# Freight Progress in War Number


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H. E. McCandless, Circulation Manager, 30 Church St., New York, N. Y.

# America's Secret Weapon

You won't find it on the production lines at Rock Island or Willow Run.

It isn't guarded at the Brooklyn Navy Yard, or tested at Aberdeen.

But it's the toughest weapon these men you are looking at will ever take into battle. It's the stuff with which all our wars are won.

The boy in the uniform doesn't call it *morale*. That's a cold potatoes word for something John American feels deep and warm inside.

Perhaps he can't give it a name. But he can tell you what it's made of.

It's made of the thrill he gets when his troop train stops at a junction point and fifty good-looking girls are at the station with cigarettes.

It's made of the appreciation he feels for a bright new USO clubhouse where he and his friends can go for a few hours' rest and relaxation.

It's made of laughter and music—when Bob Hope or Lana Turner visits his camp with a USO show.

It's even made of a cup of coffee and a Yankee smile—at some lone outpost in Alaska or the Caribbean

Maybe it's just a feeling of kinship with this land of a hundred million generous people. Maybe it's just the understanding that this whole country cares; that the soldier is bone of our bone; that he and we are one.

Name it if you can. But it's the secret weapon of a democratic army.

What can you do to sharpen this weapon? Give to the USO. This great national service organization has been entrusted by your government with responsibility for the service man's leisure needs.

The requirements of the USO have grown as enormously as our armed forces themselves. This Spring we must have $32,000,000.

Give all you can—whether it's a lot or a little. Send your contribution to your local chairman or to USO, Empire State Building, New York City.

★ USO ★

# RAILROADS NEED ADDITIONAL SIGNALING* FOR WARTIME SERVICE

AMERICAN railroad transportation is facing the greatest test of its history. Vast and intelligent preparations have been made by the carriers to accommodate the rapidly increasing demands which result from expanding war production and troop movements.

The best index of the progress they have made is the amount of material they have moved with available rolling stock. In 1929 the average ton miles per car was 14,320, and in 1942, ton miles per car reached the extraordinary figure of 21,725.

This is due in part to increased skill in railroading and more efficient operation in every department. It is also due to better locomotives, cars, brakes, track and signaling. Modern signaling systems contribute directly to the result because they assist in moving cars faster and more of the time. Of all the things which have been suggested to aid the railroads in meeting peak loads of the months ahead, signaling can produce the greatest increase in transportation capacity per unit of material employed. We should like to explain how signaling systems, particularly Car Retarders and Centralized Traffic Control, have helped and can be of still greater help. › › ›

**The term "signaling" is usually understood to include block signaling, cab signaling, interlocking, remote control, car retarders, train communication, C. T. C. and allied systems for governing the operation of trains.*

UNION SWITCH & SIGNAL COMPANY

SWISSVALE, PA.

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# CAR RETARDERS AND YARD COMMUNICATION

## speed classification of cars

Classification yards are as necessary to a railroad as a switchboard is to a telephone system and the overall efficiency of both largely hinges on the speed with which switching is done. In general, a classification yard is strategically located at a point on the system where trains must be stopped and their cars sorted to make up new trains.

Every minute spent in receiving and classification yards reduces the gain from fast main line train movement. Signaling contributes two important time savers. A system of continuous yard communication between the yard office and switch engine crews prevents operating delays. Car retarders and power-operated switches in a properly designed hump yard reduce classification time.

Analysis of operations at one retarder yard showed an increase in classification capacity of 100 per cent. Another retarder installation saved 55 minutes on each car classified.

The time savings thus achieved are multiplied at remote points on the system. Operations at other yards may be reduced, transit time for trains between terminals may be decreased, and improved schedules can be established and maintained with greater reliability.

Engineman using Yard Communication equipment to talk to the hump conductor as to the desired operation

Hump engine, pushing cars over hump, is equipped with two-way Yard Communication System.

Cutter at top of hump uncouples cars which move into classification tracks by gravity.

Hump conductor issues instructions to the crew of the hump or yard engine over the "Union" Yard Communication System.

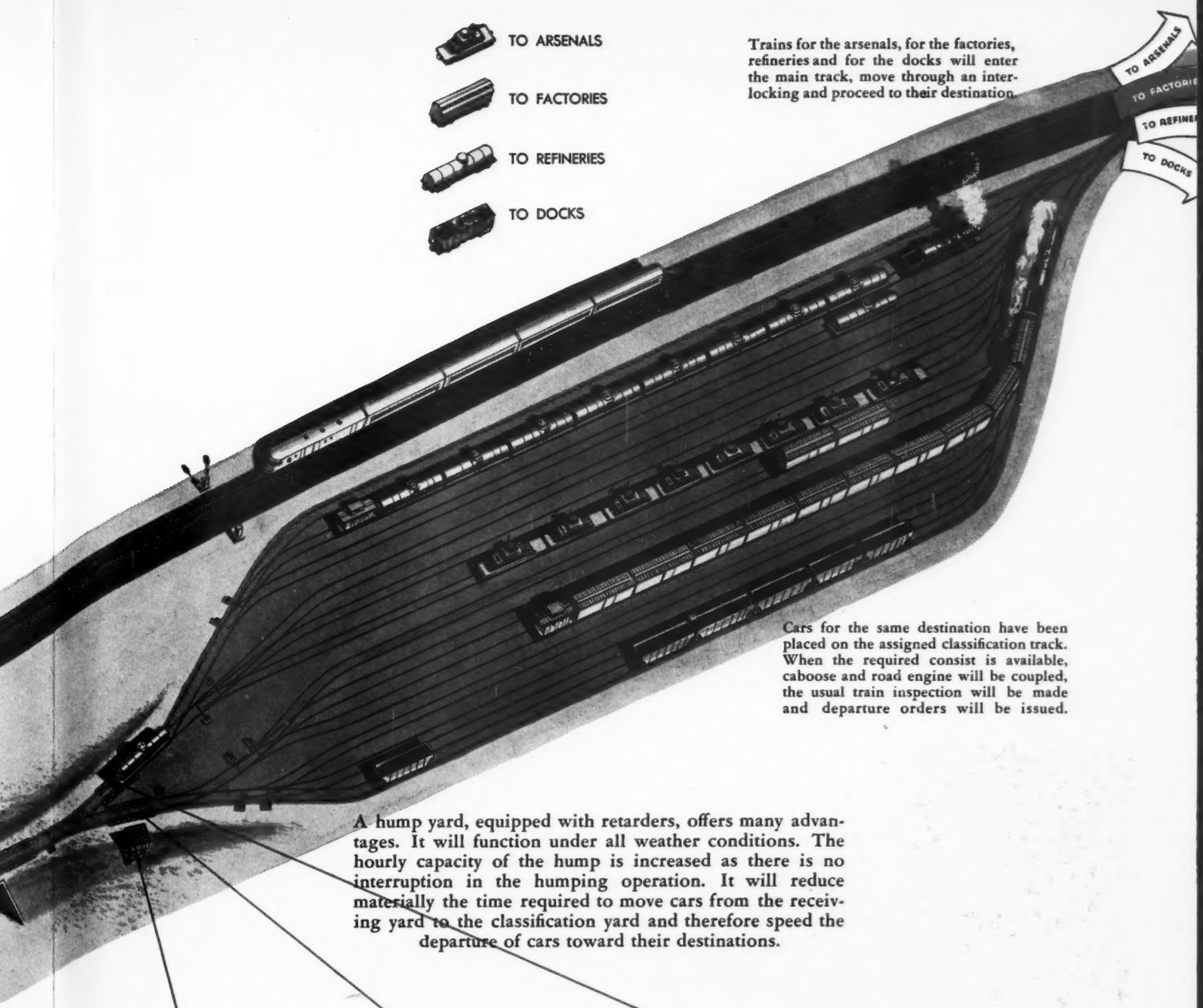
The "Union" Yard Communication System is particularly effective in overcoming delays caused by interference from physical and weather conditions which may obscure visual signals displayed at the hump. Because of the complete instructions which may be conveyed, and the quick response of the engineman to such instructions, humping time per train of cars is greatly reduced. No licenses or permits are required and the system may be generally used as any private telephone system.

NORTH

FROM WEST

Train entering yard contains mixed freight consigned to different destinations. Road engine and caboose are cut off from the train and then the hump engine pushes cars up hump.

Trains from various points of origin enter the receiving yard.




Trains for the arsenals, for the factories, refineries and for the docks will enter the main track, move through an interlocking and proceed to their destination.

Cars for the same destination have been placed on the assigned classification track. When the required consist is available, caboose and road engine will be coupled, the usual train inspection will be made and departure orders will be issued.

A hump yard, equipped with retarders, offers many advantages. It will function under all weather conditions. The hourly capacity of the hump is increased as there is no interruption in the humping operation. It will reduce materially the time required to move cars from the receiving yard to the classification yard and therefore speed the departure of cars toward their destinations.

Retarder operator, with switch list before him, manipulates levers on control machine to route cars to desired classification tracks.

A retarder is essentially an arrangement of brake shoes which are located along the track rails and forced against the car wheels by compressed air acting on a piston.

Operator positions retarders to regulate car speeds so that cars reach their tracks without exceeding a proper coupling speed.

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# C.T.C.

## OR ANOTHER TRACK

Until recently, a railroad confronted with a transportation demand beyond the capacity of the road had but two solutions —more motive power and rolling stock or more tracks. Since the advent of Centralized Traffic Control a few years ago, the carriers have had available a new solution which has been widely adopted. A road faced with more traffic than its locomotives can haul in its available cars over its existing tracks can now install C.T.C. to increase tremendously the capacity of those facilities and postpone indefinitely the time when additional tracks must be provided. One study of an installation of "Union" C.T.C. shows that, on a territory of 170 miles, freight train operation will be speeded an average of a minute a mile. Track capacity to move additional trains will be increased by at least 50 per cent.

C.T.C. has helped the railroads to handle more transportation with about 30 per cent fewer locomotives than they used during the last war, and very directly has helped the ton-mile performance. Current "Union" developments in the C.T.C. field greatly extend the scope of application of the system and have made possible maximum utilization of existing facilities with minimum use of additional vital materials.

## UNION SWITCH & SIGNAL COMPANY

SWISSVALE, PA.

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On a signal track railroad, it is necessary for the engineman on each train to know whether it is to proceed or stop at each passing siding and whether it is to hold the main or enter the passing siding. With C. T. C. operation, this information is given to the engineman directly by signals located at each point where his response is essential.

Signals and power-operated switches are positioned immediately in response to action initiated by an operator at a central point, thereby avoiding delays in the reception of orders by the engineman which occur with other methods of train operation.

As the operator is constantly informed of the locations of trains, it is possible for him to operate the signals and switches at both ends of passing sidings so as to clear the routes for both following and opposing trains with the utmost speed.

The C. T. C. machine has levers for control of switches and signals; indication lights and automatic train graph for operator's information.

# Freight Progress at a Glance

**MORE FREIGHT, FEWER CARS:** The railroads in the first two months of the current year performed 59 per cent *more* freight service (net ton-miles) than in the same period of 1918 and 17 per cent more than in 1929—and they did the job with 39 per cent *fewer* freight locomotives than in 1918 and 27 per cent fewer than in 1929. They also had 17 per cent fewer freight cars than in 1918 and 20 per cent fewer than in 1929. The figures on the amazing increase in railway efficiency are presented and analyzed in the leading editorial article herein.

●

**WHY DISCARD SUCCESS?:** The average freight engine was operated 55 per cent more miles per day in the first two months of 1942 than in the similar 1918 period, and 48 per cent more than in 1929. The average car made 108 per cent more miles per day than in 1918 and 34 per cent more than in 1929. And there have been no "car shortages" in 1942, as there were under government operation of the railroads in 1918. *The achievement of the railroads in dealing with the traffic of this war is a proof of the efficiency of co-operative private enterprise.* And still, pundits of the press and the radio, too incurious to search out the facts, are calling for centralized government control of transportation. They seek to substitute a method of proven incompetence for one of demonstrated success.

●

**SHORT-CHANGED ON CARS:** The railroads, a year ago, calculated that their supply of freight cars should be increased 120,000 from October, 1941, to October, 1942. Actually—because of limitations on materials by the War Production Board—this increase will be only about 80,000, and the oil shortage, plus rail movement of coal into New England and other car-using post-Pearl Harbor developments have occurred since the railroad estimate was made. Statistically considered, it would look as if some traffic congestion might occur in 1942. And yet, as our editorial analysis points out, so great has been the increase in the efficiency of equipment utilization, that, quite likely, the railroads will make the grade in 1942 anyhow. But 1943 is not unlikely to be something else again.

●

**YARDS NOT "BOTTLENECKS":** "Keeping them rolling" is more than just running trains out on the road. If classification yards can't sort them as fast as they come in, high-balling on the main line is a waste of zeal. A good deal will be found herein to indicate how thoroughly present-day railroad officers are taking this observation to heart.

●

**WHAT THE SERVICES SAY:** The chiefs of transportation of both the Army and the Navy have statements herein, telling what they think of the movement the railroads are giving our military forces and supplies. Brigadier General Gross tells the story in one sentence: *"Night and day the railways have been on the job, consistently meeting increasingly difficult requirements for freight and passenger equipment and service."* Speaking for the shippers, Messrs. Luddecke and Vogtle tell of their co-operative efforts and warn against complacency at past accomplishments. The future will not be so easy to handle.

●

**ORGANIZATION FOR WAR:** How the railroads are organized, through their Association—to deal with *any* problem which arises which requires co-operation—is described in an article herein. How the vital port traffic is being controlled, avoiding the congestion of the last war, is related in considerable detail; and also the set-up for dealing with military transportation. Next is described the Office of Defense Transportation—and how its various divisions "mesh" with each other and with the railroads, individually and collectively. The work of the traffic control office of the War department is next outlined, followed by the organizational changes initiated by the individual railroads to meet the extraordinary demands for service.

●

**WHAT ROADS WERE HIT HOW:** What took place on the railways of the Southwest when Pearl Harbor indicated the sudden need of additional troops and supplies on the Pacific Coast? An article entitled "The Railroads Are Enlisted for the Duration" relates some of this interesting story (all that can properly now be told). What the war did to the coal carriers in the Pocohontas region, what happened when the war came to New England, what the situation is with wheat, oil, ore and perishables—these are some of the other chapters of the story unfolded in this article.

●

**WHAT IS EQUIPMENT NEED?:** An objective analysis of freight car and locomotive performance, supply and of probable traffic volume—thereby gaging what rolling stock needs are likely to be—is presented in detail in two articles herein. The figures are all there and the reader can check the estimates if he so desires—but our analyst doesn't like the outlook for 1943. Our locomotive situation is such that our analyst concludes that the 1943 program needs to be set-up soon, so that necessary manufacturing space may be reserved.

●

**SHOPS ARE THE KEY:** Maintenance work at a high level of output, of efficiency and of persistence—combined with the utmost economy of labor and strategic materials—is obligatory, if a minimum quantity of power and rolling stock is to turn out a maximum output of ton-miles. What the railroads are doing in this vital sphere (and wherein their troubles with it lie) is set forth in informative detail elsewhere herein. Another article deals with the parallel, and closely related, contribution of the engineering department.

**ROLLING STOCK NOT ALL:** There is a tendency to make the problem of keeping up the transportation supply unduly easy to understand by stating it in numbers of cars and locomotives. But the actuality is much more complex. Not only is a continuing supply of an infinite variety of *spare parts* needed to give genuine meaning to figures of *existing supplies* of rolling stock—but similar parts and replacements have to be kept coming along for the track and other structures.

●

**HOW TO KEEP 'EM ROLLING:** The large increase in daily mileage being secured per car and per locomotive is attributable, in important measure, to wider and wiser use of devices grouped under the general heading of "signaling." These facilities embrace, not only signals, properly speaking, but automatic switches, centralized train control—and other *installations by which trains are stopped when it is dangerous for them to proceed, but which encourage their movement otherwise.* An article herein examines the contribution of these devices to efficient movement of traffic, suggesting how their further adoption (and certainly the maintenance of existing installations at maximum efficiency) will foster the railways' part in winning the war.

●

**MANPOWER PROBLEM:** There does not as yet exist on the railways a serious general shortage of competent employees—but such a shortage is coming, and the utmost ingenuity and application will be required to cope with it. Otto Beyer, the ODT's personnel division director, discusses this vital question for our readers elsewhere in these pages. He urges (1) increasing the efficiency of existing staff to the utmost, (2) getting former railroaders back to railroading, (3) recruiting and training new help.

●

**SOURCE OF MUNITIONS:** Our country's war production program would be a sad thing to contemplate, if the part that manufacturers of railway equipment and materials are contributing to it were lacking. This industry was on hand, ready to go to work for our country, because the railroads by their purchases from it in times of peace, had brought the industry into existence and sustained it.

●

**THIS IS A "RR WAR":** Because it is planes and tanks and ships which most often get involved in actual conflict—and hence get most of the attention in the news—many people fail to realize how much a "railroad war" the present conflict is. Quite apart from the "home front," in actual combat areas a modern army has to have great quantities of supplies, and large quantities of transportation call for railroads. In the Near and Middle East, in Russia, in parts of Africa, in China—railroad construction proceeds feverishly, as an article herein reveals. The planes haven't put the railroads out of business as necessary military equipment.

# TRANSPORTATION IS ESSENTIAL

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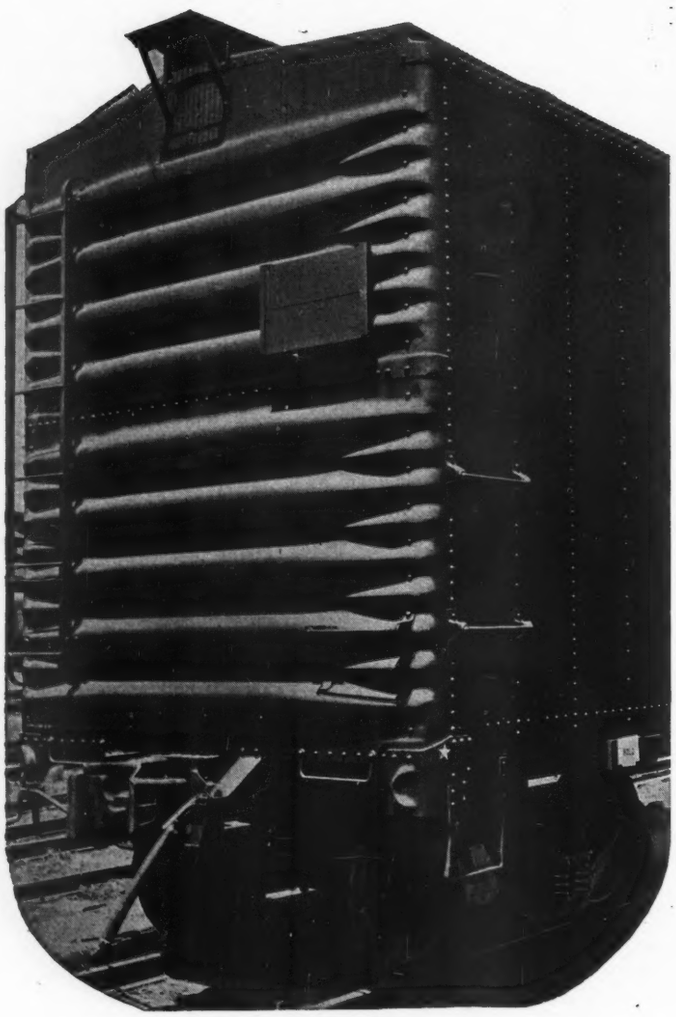
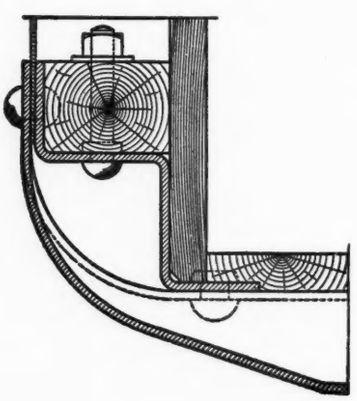


***THE WAR EFFORT IS DEPENDENT UPON KEEPING CARS IN SERVICE***



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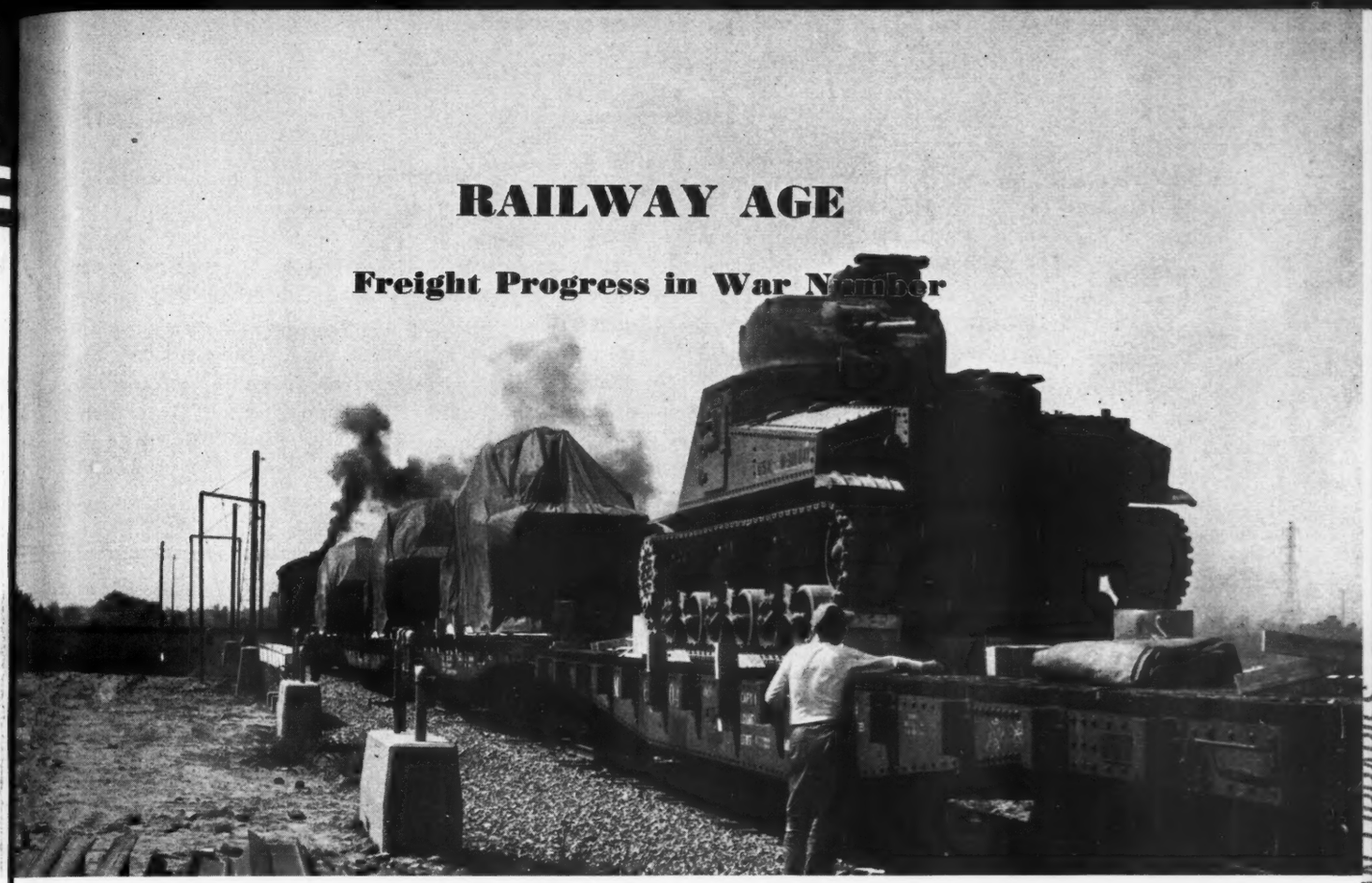


# Making Railway Service Adequate

This is the most important issue of *Railway Age* ever published in its life of eighty-six years. The issue deals with the most vital problem of transportation that ever confronted this country or the world—the problem of American railways in rendering enough service to enable our nation and its allies to achieve victory in the first "all-out" worldwide war. It describes the greatest voluntary co-operative effort ever put forth by private industry in any country—the effort of American railway managements and shippers to make adequate to all military and civilian demands a railway plant which had just suffered from a decade of depression, and upon which two years ago nobody anticipated there would be made within another decade such huge demands as already have been made. And it considers what, in addition to its already unprecedented achievements, this great co-operative effort must further accomplish, in view of the prospective further rapid and large increases in traffic demands, and the entirely unexpected limitations upon the expansion of railway capacity that have been recently imposed by government in its allocations of scarce materials.

The story told in the editorial and advertising pages is replete with details of what has been done in shops, in yards, in terminals, on tracks, and with locomotives and freight cars—details which may be tiresome to most laymen; but it is a great story that is full of drama for those who have been doing the essential work of helping the railways help win the war and who have been following closely the results. For these results, as well as the means by which they are being accomplished, are unprecedented in the history of transportation, and as important to all the people as those of the battles by land, sea and air. Without such transportation results in the United States the war by land, sea and air could not be successfully waged by this country and its allies.

We hear much, and justly, about the recent vast achievement of American industry in increasing its production for equipping and arming the army, naval and air forces of our own country, the British empire, Russia and China. But the achievement of our railways, aided by the shippers, has been equally great and important. Without the amazing increases in the volume and efficiency of freight service that have been accomplished, in almost instant response to swiftly expanding and changing needs, the mighty increases in the output of our factories and shipbuilding yards would have been utterly impossible.

The record of railway performance in 1941 compared with 1918 and 1929 given in Table I is sufficiently remarkable. But look at the data given in Table II comparing railway performance in the first two months of 1918 (under government operation), of 1929 and



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of 1942. The railways in the first two months of this year had available 39 per cent (about 10,000) fewer road freight locomotives than in 1918 and 26½ per cent (about 7,400) fewer than in 1929. They had on their lines (including those privately-owned) 17 per cent (about 400,000) fewer freight cars than in 1918, and 20 per cent (almost 500,000) fewer than in 1929. And yet they rendered **59 per cent** more ton-miles of freight service than in the first two months of 1918, while maintaining an average **surplus** of 64,000 cars —as compared with an average **net shortage** of 92,000 in the first two months of 1918. They also rendered 17 per cent more freight service than in the first two months of 1929. On the average, each freight locomotive moved **55½ per cent** more miles daily, each train carried **54 per cent** more tons and each freight car traveled **107.5 per cent** more miles daily, than in 1918. In consequence, on the average, each locomotive rendered almost **160 per cent** more ton-miles of freight service daily in the first two months of 1942 than in the first two months of 1918, and each freight car **91 per cent** more. And the increases in service rendered over the first two months of 1929, the previous year of record traffic, were 60 per cent per locomotive and 46 per cent per freight car.

**Table I.—Railway Freight Operating Results in Years 1918, 1929 and 1941**

| | 1918 | 1929 | 1941 | Per cent increase or decr., 1941 compared with 1918 | Per cent increase or decr., 1941 compared with 1929 |
|---|---|---|---|---|---|
| Net ton-miles (revenue and non-revenue) (000) | 437,018,918 | 492,313,000 | 514,520,000 | +17.7 | +4.7 |
| Locomotives in road freight service | 31,544 | 29,149 | 21,778 | −31.0 | −25.3 |
| Locomotives in bad order | 4,698 | 4,779 | 4,273 | −9.0 | −10.6 |
| Per cent locomotives in bad order | 14.9 | 16.4 | 19.6 | +31.5 | +20.2 |
| Freight cars on line (including private cars) | 2,456,649 | 2,467,165 | 1,905,115 | −22.5 | −22.8 |
| Freight cars in bad order | 143,509 | 148,030 | 88,782 | −38.1 | −40.0 |
| Per cent freight cars in bad order | 5.8 | 6.0 | 4.7 | −19.0 | −21.7 |
| Average miles per locomotive per day | 65.0 | 65.1 | 87.9 | +35.0 | +35.0 |
| Average number cars per train | 35.4 | 48.6 | 50.3 | +42.1 | +3.5 |
| Average tons per loaded car | 29.2 | 26.9 | 28.5 | −2.5 | +5.9 |
| Average tons per train | 681 | 804 | 915 | +34.4 | +13.8 |
| Total freight train-miles | 641,988,000 | 612,170,000 | 568,023,000 | −11.5 | −7.2 |
| Average miles per car per day | 24.6 | 32.3 | 40.6 | +65.0 | +25.7 |
| Average ton-miles per locomotive per day | 37,957 | 46,273 | 64,728 | +70.6 | +40.6 |
| Average ton-miles per car day | 487 | 547 | 740 | +52.0 | +35.3 |

## Government Operation in 1918 versus Private Operation in 1941

We read in a recent book by Stuart Chase, an advocate of over-all government planning, statements indicating that railroad efficiency was raised to an all-time high under government operation in 1918. Within the last few days we also heard H. V. Kaltenborn, in one of his radio broadcasts, raise a question as to why, in the interest of maximum efficiency, railroad operation should not be placed under a single unified direction. Why do not men who assume the responsibility of talking to so many people, consider it their patriotic duty, in such an emergency, to fully inform themselves so that they will not mislead the people?

The answer to those who write and talk like Messrs. Chase and Kaltenborn is partly given in the foregoing facts. To this record of facts we add the following: In 1918, the first year of government railway operation during the last war, the increase over 1917 in freight traffic handled was less than 3 per cent; the increase in operating expenses, 1 billion 153 million dollars, or 40 per cent; and the advances made in freight and passenger rates about 1 billion dollars annually. In 1941, under private operation, the increase over 1940 in freight traffic handled was **27.3 per cent** —relatively **nine** times as large as in 1918. The increase in operating expenses was only 18.6 per cent or $575 million only one-half as large as in 1918, and, in proportion to the increase in freight service rendered, relatively less than 6 per cent as large. To cover the large advance in wages granted under government pressure late in 1941, as well as increases in other expenses and in taxes, the advances in freight and passenger rates authorized have been only $275 million annually —about one-fourth as large as were made in 1918 and, in proportion to the increase in freight service rendered in 1941 only 3 per cent as large.

## Traffic, Taxes, Wages Up Over 1918— But Expenses Down and No Deficit in 1941

Bearing in mind the foregoing increases in expenses and rates, let us make some further comparisons between what occurred in 1918 under government operation and in 1941 under private operation. The facts are given in Table III, and, in summary, are as follows:

In 1918 (under government operation) the railways handled 15 per cent **less** freight traffic than in 1941, with 10,000 more freight locomotives and 400,000 more freight cars available. They made $466 million **less** gross earnings in 1918 than in 1941; but their taxes also were $323 million **less.** They paid out $218 million **more** in operating expenses and rentals in 1918 than in 1941. They employed 700,000 **more** persons in 1918 than in 1941, to whom, however, they paid an average wage of $631, or 38 per cent, **less.**

They earned $361 million **less** net operating income in 1918 than in 1941; but the government was guar-

anteeing them financial return in 1918, and, because of the small net operating income earned by its management it had to pay a **deficit** for 1918 of about $316 million—while, of course, because there was private operation in 1941, there was no deficit for the taxpayers to meet.

Messrs. Chase, Kaltenborn and others who presume to encourage a public belief that the railways were operated with maximum efficiency by the government in 1918, or that an increase of efficiency might be achieved now by some method of operation different from the present, plainly have not familiarized themselves with these extremely significant facts of history.

**Table II.—Railway Freight Operating Results in First Two Months, 1918, 1929 and 1942**

| | 1918 | 1929 | 1942 | Per cent increase or decr., 1941 compared with 1918 | Per cent increase or decr., 1941 compared with 1929 |
|---|---|---|---|---|---|
| Net ton-miles (revenue and non-revenue) (millions) | 56,973 | 77,349 | 90,763 | +59.3 | +17.3 |
| Locomotives in road freight service | 35,630 | 29,782 | 21,885 | −38.6 | −26.5 |
| Average miles per locomotive per day | 61.5 | 64.6 | 95.6 | +55.4 | +48.0 |
| Freight cars on line | 2,363,861 | 2,457,855 | 1,971,617 | −16.6 | −19.8 |
| Tons per train | 596 | 774 | 918 | +54.0 | +18.6 |
| Tons per loaded car | 28.9 | 27.4 | 29.0 | +0.3 | +5.8 |
| Average miles per car per day | 20.0 | 30.9 | 41.5 | +107.5 | +34.3 |
| Net ton-miles: | | | | | |
| Per locomotive | 1,599,018 | 2,597,173 | 4,147,270 | +159.4 | +59.7 |
| Per car | 24,100 | 31,468 | 46,035 | +91.0 | +46.3 |

## What of 1942 and 1943?

In spite of the largest increases in traffic in history in 1941 and in the first five months of 1942, the railways thus far have rendered an almost perfect service. What of the rest of 1942, and especially of 1943? Everybody who discusses the problem of expanding and improving railway service is prone, by emphasizing the vital necessity of enough serviceable and efficient equipment, to minimize by comparison the no less vital necessity of adequate permanent structures—yards, terminals, shops, trackage, signaling—as well as of the most efficient possible operating methods. This is because the numbers and capacity of locomotives and cars are so much easier accurately to ascertain and state. There is a similar tendency to exaggerate the importance of freight cars as compared with locomotives.

The railways, with the co-operation of shippers, have been able to so greatly increase the utilization of locomotives and freight cars very largely because of the large investment made, especially before, but also during, the depression in improvement and expansion of their permanent structures. Their ability to speed up the movement of freight trains and cars has also been due largely to the acquisition of locomotives more powerful, speedier and better in every respect than the locomotives that have been retired from service. So the question of how much capacity the railways have now and will have during the rest of 1942 and in 1943, is not mainly one of how many freight cars they have now and will have, or even of how much of all needed facilities they have and will have, but also one of the **balance** between these facilities, and, consequently, of how well they can all be used in correlation with each other in order to produce the maximum possible result.

**Table III.—Railway Earnings, Expenses and Taxes, Years 1918, 1929 and 1941**

| | 1918 | 1929 | 1941 | Per cent increase or decr., 1941 compared with 1918 | Per cent increase or decr., 1941 compared with 1929 |
|---|---|---|---|---|---|
| Gross earnings (thousands) | $4,881,000 | $6,280,000 | $5,347,000 | +9.5 | −14.9 |
| Operating expenses and rentals (thousands) | 4,019,000 | 4,631,000 | 3,801,000 | −5.4 | −17.9 |
| Taxes (thousands) | 223,000 | 397,000 | 546,000 | +144.8 | +37.5 |
| Net railway operating income (thousands) | 639,000 | 1,254,000 | 1,000,000 | +59.0 | −12.7 |
| Deficit under Government guarantee (thousands) | 316,000 | ..... | ..... | ... | ... |
| Revenue ton-miles (millions) | 405,400 | 447,300 | 475,100 | +17.2 | +6.2 |
| Freight revenues (thousands) | $3,454,000 | $4,826,000 | $4,448,000 | +28.8 | −7.8 |
| Average revenue per ton-mile | 0.849¢ | 1.076¢ | 0.936¢ | +10.2 | −13.0 |
| Passenger miles (millions) | 42,677 | 31,074 | 29,360 | −31.2 | −5.5 |
| Passenger revenues (thousands) | $1,033,000 | $873,600 | $514,700 | −50.2 | −41.1 |
| Average revenue per passenger mile | 2.41¢ | 2.81¢ | 1.75¢ | −27.4 | −37.7 |
| Number of employees | 1,841,575 | 1,660,850 | 1,139,753 | −38.1 | −31.4 |
| Total compensation (thousands) | $2,614,000 | $2,897,000 | $2,336,000 | −10.4 | −19.4 |
| Average compensation per employee | 1,419 | 1,744 | 2,050 | +44.5 | +17.5 |

## Will There Be Enough Freight Cars?

It is fortunate that the War Production Board has authorized allocation of enough materials to build 1,226 locomotives in 1942, because there was developing greater danger of a locomotive shortage than of a freight car shortage. Unfortunately, it has so restricted its allocations of materials for other purposes as

(*Continued on page 989*)

# Railway Service—Vital t

## All-Out Effort

***A Pledge by John J. Pelley***
***President, Association of American Railroads***

### *What Does Efficient Transportation Mean?*

**The railways are now operating at the highest efficiency in their history. The continuation of this efficiency is vital to the national welfare. This continuation is pledged by the railways through their spokesman, John J. Pelley, president of the Association of American Railroads.**
**And this service is contributing very directly to the present military and civil objectives of our country. A spokesman for the government commends the record now being made and points to the still greater task ahead. High officials of our armed forces testify to the indispensability of adequate transportation to their activities and to the efficiency with which they are now being served. Spokesmen for shippers' organizations testify in equally commendatory terms to the value of this service to American industry. Their statements are presented here.**

SINCE the first World War, progress has been made in all the weapons of war. Guns, tanks and airplanes, to mention a few, are more efficient and more effective.

The same is true of another weapon of war—the railroad freight car. It hasn't changed much in appearance in the last twenty years, but it has changed in other ways. It is bigger, stronger, more capable of doing a better job. It has kept pace with the other weapons of war.

The railroad freight car is truly a weapon of war because it is the freight car, together with the locomotive which pulls it and the track on which it runs, that makes possible all of the other instruments of war. Without them, the whole war effort would collapse.

Never before in history has the freight car meant so much to the nation. Never before has so much depended upon the service it performs. Never before has its proper use been so important. That is why co-operation between the railroads and those who use them is so essential at this time.

A freight car never was intended for storage purposes. It was built and put on the track as a vehicle of transportation, a machine designed to move things. It should be used for nothing else.

The job of keeping freight cars moving is the responsibility of the railroads and shippers alike, and both have done, and are doing, outstanding jobs in keeping the wheels turning. The railroads, generally speaking, have stepped up their operations by moving cars faster on the road and through terminals. They have, insofar as possible, not permitted cars to stand on industry tracks after loading.

The shippers have co-operated splendidly. Hundreds of examples could be cited of steps they have taken to load and unload cars promptly, to load cars to capacity, and to return cars to the railroads in condition for immediate service. In fact, shipper co-operation is largely responsible for the record made since the beginning of the national defense program. Certainly without it, the railroads could not have met each emergency so successfully as it arose.

It appears unlikely now that the railroads will be per-

# tal to Our National Objectives

Statements from officers who know of remarkable achievements to date—of still larger tasks ahead

mitted to acquire all the additional equipment they need this year. Under such circumstances, there is but one thing for railroads and shippers to do—to keep on working together to get the utmost in service out of the cars and locomotives which can be had.

## To American Shippers

***A statement by Joseph B. Eastman***
***Director, Office of Defense Transportation***

A TREMENDOUS responsibility rests upon the carriers and the shippers of the United States. The carriers are doing a splendid job, but the peak has not yet been reached and they will need all the help they can get. No one can give them better and more effective help than the shippers, and I know the shippers are praying that the carriers make good.

Unlike wars of the past, this war is spread over the entire world. Transportation is all-important. Nothing is gained by producing all the equipment and supplies necessary to prosecute the war unless we are able to transport those supplies to the theaters of action.

All of us have the same interest at stake, to wit, beating the enemy. One reason why the carriers have been able to do such a good job is because they have had the support of the shippers.

The carriers of this country set a record for handling freight in 1941. Nevertheless, that record will be broken by the volume of traffic which must be moved this year—and still more must be moved in 1943. Great tonnages that formerly moved by coastwise and intercoastal vessels have now been added to the burden of the inland carriers.

If there were full opportunity to build more cars, locomotives, barges, pipe lines and trucks, there would be no need to fear a break-down in our transportation system. However, there is only a limited supply of critical materials and tools. The demands of War upon that supply are tremendous. The War Production Board has the difficult task of allocating what is available between the demands of the War Production Program and civilian needs. There is just *not enough* to go around.

The carriers will not have an abundance of equipment. They *must* bring every ounce of their reserve power into play and make the maximum use of what they have. The success of the efforts of the carriers to meet the needs of the shippers depends in part upon the close and efficient co-operation of these shippers.

Quick loading and unloading and full loading of cars by the shippers are essential. Another effective way in which shippers can co-operate is to adjust their demands for transportation to avoid periods of peak traffic such as may be expected this fall. I cannot urge too strongly the importance of every possible effort being put forth by every shipper and receiver of freight to spread the load. If you have something which must move, do it when the carrier is most able to handle it.

In view of the impending load upon the carriers dur-

ing next fall, it is possible that it may be necessary in some sections or with respect to certain movements to establish priorities in freight transportation, even to denying or postponing for extended periods the movement of certain types of freight. While this will be done only as a last resort, it should be stated that it is a program well within the realm of possibility and that my organization will be prepared to take such steps whenever and wherever necessary.

## Vital to the Navy

### *A tribute from Admiral Ray Spear Chief of Transportation, United States Navy*

THE Navy has a vital interest in transportation and this transportation is by no means confined to the sea. The Navy buys materials throughout the country and ships them from thousands of inland points. It moves men across the continent by land, and thousands of cars and thousands of men are moving on our railroads daily in the direct service of the Navy. For this purpose, the railways of the United States are vitally essential to the Navy, and prompt, efficient railway service is a prime requisite of many Navy operations.

It is a source of satisfaction to be able to state that, in this vital phase of Navy activities, the railway officers of the United States have shown the very best co-operation in their efforts to meet our demands upon them. The steady increase of these demands has resulted in no slackening of this co-operation; there has been no letdown in spirit or in service. Under the ever greater demands to be expected, it is essential that this relationship be continued on its present co-operative basis.

Official U. S. Navy Photo

## Transportation the Life Blood of the Army

### *An appreciation from Brigadier General C. P. Gross, Chief of Transportation, United States Army*

THIS war is, above all, a war of movement—movement of ground forces, air forces, and their supplies between induction stations, training centers, mobilization points, ports of embarkation, and "fronts"—wherever flies the flag of the Army of the United States.

Transportation is the life blood of this great Army. It must flow freely through all available channels: rail, highway, water, and air. The transportation needs of the Army are great, and they are growing, particularly for mass transportation.

To meet these needs, the War Department has called and will continue to call upon the railways of the United States for all-out assistance in the expeditious movement of hundreds of thousands of men and millions of tons of vital materials and supplies. Night and day the railways have been on the job, consistently meeting increasingly

Photo by U. S. Army Signal Corps

difficult requirements for freight and passenger equipment and service.

Army representatives, many of them recruited from railway personnel, and railway representatives, from executives to extra train crews, have been working in closest co-operation to "Keep 'em Rolling." Until victory is won, the needs of the Army will continue to grow, and more and more rail service will be required. This can be provided only if our vital railway plant and facilities are continued in their present high state of efficiency. We of the Army look to railway men with every confidence in their ability to meet the test.

## Co-operation

***A statement of policy by R. R. Luddecke***
***President, National Industrial Traffic League***

THE position of the National Industrial Traffic League in the transportation affairs of this country was definitely set forth at the meeting held by that organization in Cincinnati on April 14, at which a special resolution was passed to the effect that this organization dedicates itself to all-out co-operative effort with other agencies, governmental, transportation, and shippers, to secure maximum utilization of available transportation facilities, to the end that our war effort may be advanced with the greatest possible expedition and efficiency, and essential civilian needs may be met insofar as possible.

At the meeting held in Cincinnati on that day it was very strongly stressed that the phrase "industry as usual" is out. It was the feeling of the League that our transportation systems had always been efficient in the past, and by the close co-operation which is being worked out by all parties in the transportation industry, and people using transportation, it might be possible to go even farther than we have gone.

The League is not only stressing to all of its members

the seriousness of the transportation situation, but its members are contacting shippers and other persons interested in the transportation industries, such as traffic managers not members of the organization, with the thought that by so doing a much broader understanding of the transportation effort will be reached.

A Special Committee was appointed to work with all agencies of the government and railroads, so that a clear understanding may be reached by all of what they are trying to accomplish. It is our thought that by these efforts, and with the assistance of our transportation agencies, and such assistance as we will be able to give them, the war transportation will be carried to a successful conclusion.

## To the Shippers

***A message from A. W. Vogtle***
***President, National Association of Shippers Advisory Boards***

HITLER ran into his greatest obstacle on the Russian front owing to the difficulty of maintaining his supply lines. Evidence is accumulating to indicate that Japan is likely, more and more, to encounter the same kind of trouble. When they have lost this war *that will be one of the principal reasons.*

It must not happen here. Plainly, our job is to outproduce the enemy, but that is only half of it. We have also the immediate and vital task of placing America's unparalleled production where it will work and fight. This—the movement of what it takes—where, when, and in whatever quantity it is needed by our fighting men on every front—is the grave responsibility of those of us who are concerned with transportation.

We have the organizations of shippers and carriers, set up and functioning for this kind of emergency. They are being put to the test. We can review with encouragement the accomplishments of 1940 and of 1941 when the greatest transportation record in all history was achieved. *But we cannot afford the slightest degree of complacence.*

With signs on every hand that events are rushing toward a climax, let every one of us exert all of his knowledge, experience, skill—every mental and physical effort to enhance and accelerate every phase and factor of the shipping procedure, to get the utmost efficiency out of the finest transportation machinery in the world. It is more than a duty. It is a challenge and a call to arms. The shippers accept the challenge—pledging our united strength and unremitting perseverance in seeing the job through until Victory is won.

**Operations Through Huge Terminals Require Efficient Organization**

# Girding for Wartime Transportation

## Railways and government perfect organization to meet emergency needs

THE perfect record that the railways have made so far in meeting all demands for transportation has not been accidental. It is the result of vast expenditures made, even during the depression, to develop and keep the physical plant in shape, and of advance planning, some of it dating back as far as 20 years, to insure operating methods capable of meeting any emergency. This preparatory organization has been in process of development for years and the outbreak of war merely accelerated it, culminating in December in the creation of the Office of Defense Transportation. The railways' individual efforts, their united work among themselves and among shippers and the activities of the O. D. T. comprise a record of constructive leadership and accomplishment that is unique among industries.

This remarkable record has grown out of the fact that the lessons taught by the last war and the inefficiencies brought into the limelight by the shortcomings of gov-

ernment control, made an ineradicable impression on the railway officers of that day. The lesson was a tragic one and the vast majority of the railway executives of today, who were mostly junior executives in 1917-18-19, have not forgotten it. If such a debacle can be said to have had any value, it was in the lessons it taught about what *not* to do.

Plans to avoid a recurrence of the confusion of the last war began to be formulated very soon after the railways were returned to private ownership in 1920. Surveying the wreckage rather ruefully, railway officers took stock and decided what must be done. Lack of co-operation between military and transportation authorities was one of the most glaring weaknesses and steps were initiated almost immediately to rectify this. The organization that is now known as the Association of American Railroads was created and began functioning in its numerous branches. The various railway technical organizations intensified their programs for the interchange of ideas, looking to the betterment of railway practices. A great era of technological progress was at hand and the railways took advantage of it.

### A. A. R. Activities

The Association of American Railroads is a unique organization in comparison to similar bodies set up by other industries. It was formed on October 12, 1934, as a single authoritative national organization to handle the problems of the industry. Its ramifications extend into every field of railway activity and research. Each railway department is represented by a section of the A. A. R., and the men making up these sections are constantly at work to improve the operations of the particular field of railroading they represent; and to distribute information regarding this field to all railways, leading to greater co-operation among the officers engaged in similar pursuits on all the railways.

The statement of organization of the A. A. R. described its scope and purposes clearly, as follows: "The railways recognize the need for a forceful, independent organization to act in the capacity of a general staff for the railways as a whole, merging under one authoritative direction the activities of the present railroad associations and organizations. The new organization will take the initiative in attacking the problems which confront the industry, retaining the beneficial activities of existing regional groups and instituting energetic study and action on all subjects related to American railway progress.

"The new organization constitutes an aggressive and determined effort to deal with common problems. It is the purpose of this movement to include every phase of railway transportation and to employ every constructive approach, not merely in the solution of difficulties, but

**The railways are determined that the transportation debacle of the last war shall not be repeated. Through the Association of American Railroads they are correlating and unifying the activities of all the roads.**

**Through port control, traffic approximating that of World War is now passing through North Atlantic ports without congestion. Through a special organization for the co-ordination of military transportation, army and navy officers are relieved of details of transportation service and movements of armed forces and materials expedited and co-ordinated. The Office of Defense Transportation is rendering invaluable service to railways by presenting their needs for materials to federal agencies and initiating measures for the elimination of wasteful services.**

**In short, the railway industry is now a closely integrated industry, working unitedly and efficiently in meeting the needs of the nation.**

**Complete Co-Operation Between the Railways and Military Authorities is Speeding Wartime Traffic**

in hastening and directing the improvement and development of the industry."

### Shipper Co-operation

Co-operation between the railways themselves is vitally important, but co-operation between them and their customers, the shippers and receivers of freight, is equally important. To meet this need 13 shippers regional advisory boards were formed almost two decades ago under the initiative of the Car Service division of the American Railway Association, and their work, which is described elsewhere in this issue, has been indispensable and invaluable in the present emergency. The increasing interest in the activities of these boards is shown by the fact that shipper attendance at their board meetings has risen from an average of 107 during the year 1941 to an average of 225 so far this year.

The railways also undertook the formation of territorial military passenger traffic committees, as well as an inter-territorial committee having jurisdiction over the entire country. The work of these committees has exerted an important influence on the movement of traffic, not only through the prevention of possible interference with freight trains, but also because modern military practice is tending more and more toward the transport of equipment with troops. The result has been that many troop trains now carry as many or more freight cars than passenger cars. These committees, through long study and experience, built up a high degree of mutual confidence and co-operation with the officers of our armed forces in charge of traffic. The result has been exceptionally smooth operation.

The Association of American Railroads went into action as soon as the National Defense program was made effective, in accordance with the plans that it had previously prepared for such a contingency. A detailed description of these activities is given in another article in this issue. Briefly, mentioning only a few of the activities, a manager of port traffic was appointed to see that lease-lend and other export traffic flowed smoothly through our ports, which had become dangerous bottlenecks during the last war. A manager of military traffic was also appointed to work closely with government officers in charge of war traffic. In addition, all the many normal functions of the A. A. R. were revised to meet the new problems presented by the emergency.

In the last year the vast changes which have occurred in the world picture and the entrance of the United States into the war have altered the port situation materially. As a result, there has been a substantial expansion of the port organization of the Car Service division, including the establishment at San Francisco of an assistant manager of port traffic with jurisdiction over the Pacific Coast ports.

### The Port Situation

A year ago, the movement of commercial freight to foreign countries decreased and in many instances ceased because of the disruption of ocean shipping facilities and one of the problems that then faced the railroads was that of the disposal of cargo which had been moved to the ports but which, because of these conditions, had to be disposed of in some other manner than that originally intended. This situation continues to exist. Today, the area to which commercial shipments can be freely transported is limited and includes principally South America, South Africa and the Caribbean area.

Of the total volume now moving through United States ports, less than 25 per cent is "commercial" freight, as distinguished from that for our own government or for our allies.

The railways are currently unloading at all ports between 2,000 and 2,500 cars daily, with a total "bank" of between 20,000 and 25,000 cars or an average of 10.3 days' supply. With the exception of an abnormal holding of lend-lease freight awaiting ships at one or two North Atlantic ports, there is now no excessive "bank" at any port. As of March 15, of the 22,000 cars on hand at the ports, only approximately 5,000 had been on hand over 15 days.

At New York, the average unloading of export and coastal freight has increased from less than an average of 500 cars per day in the early months of 1939 to more than 1,300 cars per day in December, 1941, and January, 1942. There are currently approximately 8,500 cars of freight on wheels for lighterage, about 88 per cent of

**Getting Trains Over the Road Speedily and Safely Requires Efficient Organization**

**Port Traffic Has Been Organized to Eliminate Congestion at These Vital Points**

which is for export and the balance for domestic delivery in the harbor. There are also approximately 5,500 carloads of freight in covered pier storage and about 7,600 carloads in open pier and ground storage, with room for about 1,400 carloads additional on covered piers and 6,000 on open piers and ground storage.

The lighterage situation at New York comprises one of the bottlenecks which must be kept open. Here, the Joint Railroad-Steamship committee, under the chairmanship of E. J. Karr, vice-president of the Calmar Steamship Line, is functioning admirably and few lighters are held under load over 48 hr. at steamship piers, despite the fact that the volume of lighterage freight has increased greatly. Furthermore, the tonnage per lighter has been stepped up so that the average load now approximates 100 tons, which is more than double what it was in 1939.

Approximately 880,000 cars of export and coastal freight were unloaded at all ports during the year 1941, as compared with 819,000 cars unloaded during the year 1940. The unloadings at the North Atlantic ports were approximately 414,000 cars, which compares with 416,000 unloaded in 1918, the heaviest year of the World War traffic. In other words, the 1941 traffic at North Atlantic Ports approximated the volume at the peak of the World War in 1918.

Equally important, the ports have been "liquid" at all times except for a few days following "Pearl Harbor" when the government ordered all export movement suspended until it could determine just what materials were needed in the Pacific area. To maintain a free flow, controls have been in effect on commercial freight moving through the North Atlantic ports and through the Port of New Orleans for some time where shipping service has been more or less interrupted. They have also been in effect for some time on all commercial shipments through the Pacific Coast ports. Effective April 18, these controls were extended to cover all freight for export through all ports, except government and lend-lease freight.

Permits are issued by the manager of port traffic of the association after shippers have secured steamship space or after they have indicated their ability to remove the freight from railroad premises at the port immediately upon arrival.

These controls have been worked out in conjunction with the steamship conferences and with the individual steamship lines and with the co-operation of local committees so that no appreciable embarrassment has been caused in any quarter. Local committees, made up of railroad and steamship representatives, functioning largely around representatives of the Car Service division,

**Terminal Operations Must Be Conducted with Maximum Co-Operation Between Connecting Railways**

have been extremely helpful in working out the details of the problems which have arisen. In view of the very substantial reduction in overseas shipping services, it is remarkable that it has not been found necessary to place more rigid restrictions upon the movement of export freight than has been done. Shippers themselves have co-operated with the railroads in every possible way in avoiding the movement of freight to the ports unless ocean space was reasonably assured.

The very satisfactory condition which has prevailed at the ports has been due not only to the splendid job which the railroads themselves have done but also to the co-operation extended by shippers, brokers, forwarders and the steamship people. It is not too much to say that without this co-operation, it would have been impossible for the railroads to have performed so satisfactorily. This assistance, which it is confidently expected will be continued and even increased, should enable the railroads to handle the flow of business through the ports in 1942 to the general satisfaction of all concerned.

As a means for maintaining this record, all the railways serving the highly important New York harbor have materially increased their marine fleet to take care of port traffic. The Delaware, Lackawanna & Western, for example, placed six new 500-ton covered barges in service during 1941, and six more so far in 1942. This makes a total of 93 barges in the fleet of this road, which includes tugs, steam lighters, steel car floats and ferry boats as well. As with freight cars, repairs to this marine equipment have been speeded up at the Brighton yard on Staten Island, operated jointly by the D., L. & W. and the Lehigh Valley, so that the maximum service hours may be obtained from it.

### Military Transportation

A highly important factor in the present war transportation effort of the railways is the Military Transportation section of the Car Service division. This section was established originally to co-ordinate and arrange movements of the Army, Navy, Marine Corps and the Civilian Conservation Corps, but it is now also handling many other group movements. During the last month this section has arranged for the movement of such diverse groups as civilian employees going overseas for repair work, enemy aliens and prisoners of war moving to points of concentration, British seamen going to and from rest areas in this country, and is now also handling all movements of the Coast Guard, which branch is now under the jurisdiction of the Navy. While the actual number of troops and naval forces handled is, of course, not for publication, it may be stated that during the last four weeks arrangements have been set up for the movement of nearly one million men and if the movement of selectees and other small groups routed direct through the various passenger association chairmen is included, the total will exceed this figure.

As the armed forces become better organized and the tempo of our war effort is stepped up, large scale movements will increase and it is with such movements that the co-ordination has been most effective. What is being continually striven for, with fine co-operation from the Army, is to co-ordinate divisional moves so that equipment, passenger as well as freight, may be used to the fullest extent possible. A movement now in progress is typical. During the early part of this month an entire division was moved from one of the camps in the east to the west coast, utilizing a large number of baggage and tourist cars and approximately 1,000 freight cars. To replace these troops, a division of the same size was to be moved to this camp. The departure date of the division moving to the eastern camp, then located in Texas, was scheduled so that its arrival in the east would follow immediately after the departure of the outgoing division. This would have meant that the same amount of equipment would have had to be gathered and placed at the camp in Texas. By following through with the general staff and securing the co-operation of several of the western railroads, the departure date out of Texas was delayed sufficiently that the equipment moving to the west coast could be released, run in solid trains back

to the camp in Texas, and there used for the movement east. This saved the use of a large amount of equipment and eliminated the dislocation of cars that would have been inevitable if these movements had not been co-ordinated.

The movement of military traffic is only one phase of the activities of this bureau which include also many operating problems which the experienced personnel is well qualified to handle for all branches of the armed forces. Typical problems relate to clearing routes for the movement of shipments of excessive dimensions, furnishing information as to track and unloading facilities and car construction and particularly in expediting freight to destination. Because of the many requests to locate, trace, divert and to arrange for special movements, this section has established a special movement bureau which, organized at the request of the Army and Navy Departments, has been invaluable to all branches of the service.

All diversions are now handled by this bureau and it is now an integral cog in the present control of freight moving to the various ports.

### The Office of Defense Transportation

In the summer of 1940, early in the development of the national defense program, Ralph Budd, president of the Chicago, Burlington & Quincy, was selected to head the Transportation division of the Advisory Commission to the Council of National Defense. While the C. N. D. underwent kaleidoscopic changes in scope and personnel during the months that followed, Mr. Budd's status was not disturbed and he continued to advise the federal administration on transportation problems and on the traffic to be expected, recommending equipment purchases needed to handle this traffic and in turn advising the railways of the plans of the administration so far as they concerned transportation. He continued in this highly important capacity for 18 months, or until December 23, 1941, when President Roosevelt issued an executive order creating the Office of Defense Transportation and appointing Chairman Joseph B. Eastman of the Interstate Commerce Commission as its director. Shortly thereafter, Mr. Budd relinquished his responsibilities to Mr. Eastman and returned to the Burlington, taking with him the heartfelt appreciation of the industry he had served so well.

The new office, as originally set up, comprised four divisions—railway transport, motor transport, inland waterway transport, and coastal and intercoastal transport. Director Eastman was given broad powers covering the co-ordination of transportation policies and activities of federal agencies and private groups; directing and co-ordinating wartime and commercial traffic, exercising the emergency powers given the President in the Interstate Commerce Act, and advising on emergency legislation affecting domestic transportation.

He immediately undertook the complicated task of creating an organization to do the work that had been assigned him by President Roosevelt.

The various divisions and sections as at present set up are as follows:

Division of Railway Transport
Division of Traffic Movement
Division of Rates
Section of Materials and Equipment
Division of Transport Personnel
Division of Motor Transport
Division of Storage
Division of Local Transport
Division of Inland Waterway Transportation
Division of Coastal and Intercoastal Traffic
Division of Transport Conservation

### Traffic Division Functions

Director Eastman has explained the role of the division of traffic movement as follows:

"The division of traffic movement was set up in response to the direction of the President that the O. D. T. 'co-ordinate and direct domestic traffic movements with the objective of preventing possible points of traffic congestion and assuring the orderly and expeditious move-

**The Railways Are Moving War Materials with Speed and Regularity Never Before Approached**

ment of men, materials, and supplies to the points of need.

'In connection with the United States Maritime Commission and other appropriate agencies, co-ordinate domestic traffic movements with ocean shipping in order tc avoid terminal congestion at port areas and to maintain a maximum flow of traffic.'

"These two paragraphs confer very extensive authority and impose an equally heavy responsibility. They relate to traffic movements by 'railroad, motor, inland waterway, pipe line, air transport, and coastwise and intercoastal shipping.' It is not my desire to exercise this authority unless there is clear need for such action, but in view of the heavy responsibility, I must be prepared to act if such need develops. In time of war, also, no one can foresee what changes in conditions may occur, perhaps in the form of sudden emergencies.

"I shall expect the Division of Traffic Movement, therefore, to become fully informed with respect to the organizations and methods by which both war and civilian traffic are now directed and controlled, the results which are being accomplished, and the possible dangers which lie ahead. And I shall expect the Division to be prepared to act, where action is necessary. Neither the military authorities nor the private shippers of the country, however, need fear that there will be any attempt to change existing methods, unless plain need is found to exist, nor, in that event, without taking counsel of those immediately concerned.

"We all realize that thus far the transportation agencies of the country have taken care of all traffic needs exceedingly well. We also realize that a very large factor in that record of success has been the splendid co-operation which the carriers have received from the shippers, both public and private. It would be a critical mistake to disturb that co-operation or to fail to promote and encourage even more effective co-operation for the future. The fact is, indeed, that, to be successful in its efforts, the Office of Defense Transportation must have the full co-operation of both the shippers and the carriers."

### Personnel Functions

The functions of the division of transport personnel have been explained as follows:

"This division will act as a co-ordinating and advisory agency with respect to all personnel problems among employees of transportation agencies which require action on the part of the O. D. T. The division will be principally concerned with problems of labor supply and labor requirements in all branches of transportation. These will involve forecasting as accurately as possible the personnel needs of the industry, advising the selective service authorities as to occupational deferments, encouraging the development of recruiting and training programs where this is necessary, and co-operating with carriers and their employees in the effort to secure the most efficient utilization of transportation manpower in a labor market situation in which shortages of personnel are bound to occur.

"Problems of labor relations as such will not be handled by the division. If questions of this sort are brought to the attention of the O. D. T., they will be referred to the appropriate agencies outside of the office already established to handle labor relations matters. The division began its work with a survey of existing sources of labor market information among government and private agencies as to workers engaged in transportation by rail, motor, water, air and pipe line. Where existing information is inadequate, the division will co-operate with these agencies in securing more complete labor market data so that personnel shortages can be anticipated and the necessary remedial actions taken.

"Expanding war efforts make it highly important to secure the maximum effectiveness of the existing supply of transportation employees. Many phases of transportation operations require a larger standby force than would be necessary if operations were carefully regularized. The Division of Transport Personnel, in co-operation with other divisions of the O. D. T., will be concerned with plans for stabilizing operations so that the smallest number of employees possible who are not actually working need be on call for work."

### O. D. T. Activities

In a surprisingly short time, the organization went into effective action in nearly all the multitudinous phases of transportation. Director Eastman repeatedly stressed the functions of the O. D. T. as co-operative rather than coercive. One of the first jobs tackled was the preparation of tentative estimates of locomotives and of freight and passenger cars needed by the railways, and these estimates were submitted to the War Production Board in February. Unfortunately, the W. P. B. did not see eye to eye with the O. D. T. as to the rolling stock the railways need, and Mr. Eastman made no secret of his disagreement with the "niggardly allotment." He said: "Nothing enters into this war in which transportation is not an ingredient—transportation is not only indispensable, it is all-pervasive. Why, in the organization of the W. P. B., transportation should be classed along with civilian supply, I am unable to understand."

In a later statement, Mr. Eastman classified the securing of materials and equipment as the No. 1 problem of transportation. "However," he continued, "neither the carriers nor the shippers can expect any diversion of materials from war products to transportation for the supply of new equipment and facilities to perform transportation which can be performed by existing equipment and facilities if they are used in the best practicable way."

### Minimum Load for L. C. L.

The first mandatory order issued by the Office of Defense Transportation produced a storm of comment. General Order O. D. T. No. 1—Merchandise Traffic, was issued March 24, and provides for minimum weight limits on loadings of L. C. L. cars, beginning at 6 tons on May 1, rising to 8 tons on July 1, and to the desired minimum of 10 tons on September 1, 1942.

Effective May 15, the O. D. T. banned grain shipments on the Great Lakes except by special permit. Mr. Eastman stated that the prospect of an unprecedented movement of ore tonnage, estimated at nearly 90 million tons for the season, had prompted the issuance of this order. "Diversion of grain tonnage to the railways," he explained, "will be necessary in order to assure maximum carrying capacity for iron ore. Certain readjustments will probably have to be made in railway operations to handle the added burden, but thus far the railways have met every freight emergency with remarkable efficiency. I am confident I can count on them in this instance."

In any normal season, the effect of this order would create a tremendous problem for the railways. This year, however, because of the storage situation the readjustment of operations necessary should not be too difficult, as, with storage facilities glutted, the normal demands for grain transportation will be sharply curtailed.

In addition, the O. D. T. has been engaged in numerous other important activities not directly applicable to

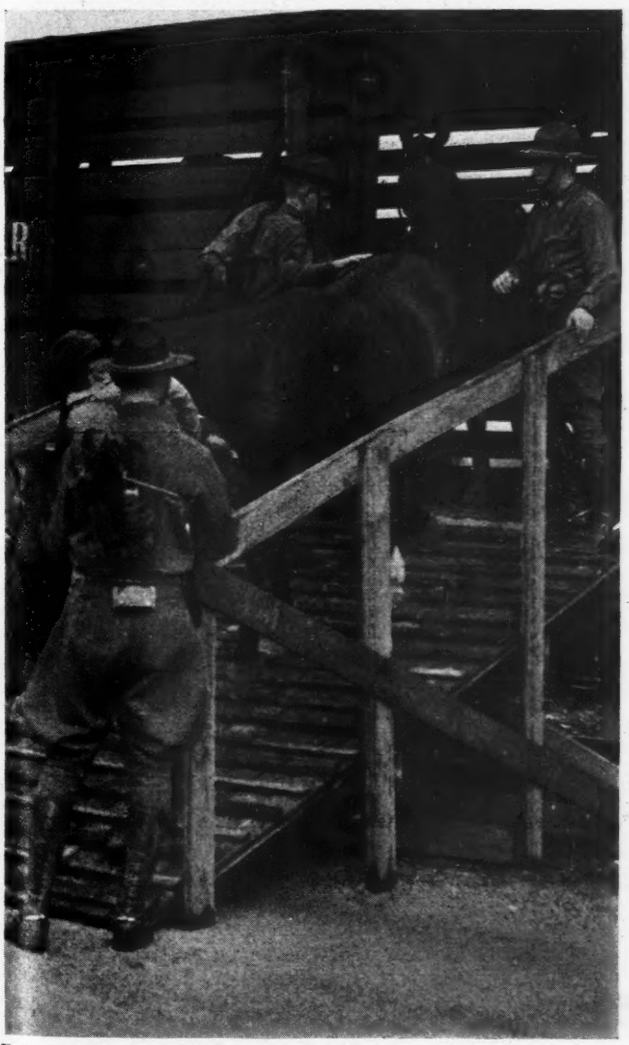
railways and in quieting rumors that offline agencies will be closed at once, that passenger service will be immediately rationed and many others. The activities of the Division of Transport Personnel, other than those mentioned in this article, will be found in the article in this issue covering railway labor problems.

An unexpected function of the O. D. T. developed on March 21, when President Roosevelt ordered that body to take over the operation and management of the Toledo, Peoria & Western. This was the outcome of a strike that began on December 28, 1941, over rules and working conditions, which eventually took on the proportions of a national issue and received widespread publicity. J. W. Barriger, associate director of the division of railway transport, was appointed federal manager of the T. P. & W., and made immediate arrangements for the return of the strikers under the working conditions prevailing prior to December 28. The O. D. T. is concerning itself entirely with the operation of the line and has taken no part in the labor negotiations. As soon as these have been settled by other agencies, the O. D. T. will release its control of the T. P. & W.

### Traffic Control Office

Another government transportation agency that was recently set up is the traffic control office of the War department. This is headed by W. J. Williamson, formerly general traffic manager of Sears, Roebuck & Company, who works under the direction of Major General Somervell, chief of the service of supply, and Brigadier General C. P. Gross, chief of transportation for the Army. The traffic control office comprises a rail transportation unit, headed by G. Metzman, formerly assistant vice-president, New York Central; a water transportation unit, with Colonel J. M. Franklin, former president, United States Lines, in charge; and a motor and air transportation unit, directed by F. C. Horner, former assistant to the chairman of the General Motors Corporation. L. J. Coughlin, former vice-president of the Tidewater Terminals & Inland Warehouses, will have charge of in-transit storage depots, and Lieutenant Colonel E. C. R. Lasher is Mr. Williamson's chief assistant. C. E. Denney, president of the Northern Pacific, and W. S. Guy, traffic manager of the U. S. Steel Corporation, served as advisers in planning the new set-up and will continue as consultants.

Mr. Williamson has outlined the functions of his office as follows: "Eventually, it will have jurisdiction over all government shipments to the ports; and no cargo will be moved to a port without a clearance from T. C. O. Its branch chiefs and their activities are all complementary to each other. Colonel Franklin, as head of the water transportation, has jurisdiction over all matters pertaining to the handling of freight at the seaboard, i. e., ships, stevedoring, warehousing, etc. Mr. Metzman's job is that of seeing that rail facilities for moving cargoes to the proper ports are open and available, while Mr. Horner has a like assignment with respect to highway and air transport facilities."



U. S. Army Signal Corps Photo

**Loading and Unloading Troop Trains Has Been Brought to a Science**

### Organization on Individual Railways

Supplementing these broad national measures, the individual railways have also taken many steps to meet the revised situation. Naturally, property protection and arrangements for operation under blackout conditions received immediate attention. Problems of organization followed immediately thereafter. The traffic representatives of the railways were transformed almost overnight from salesmen to traffic service men, in which capacity they are performing important functions in insuring the prompt transmission of information regarding the movement of wartime freight and passengers, as well as many other duties looking toward the speeding of war production. This change was not as difficult as it might have been, for the reason that all of the roads, to a greater or less degree, recently have been enlarging the functions of their traffic men to include service as well as sales.

To facilitate complete co-operation still further, many railways have established branch offices in Washington, headed by outstanding traffic men, or have enlarged and changed the scope of their off-line agencies already established in Washington. Other lines have created the office of executive assistant in various key points to permit of speedier handling of matters requiring executive attention. Even before the war, traffic representatives were stationed at all important camps and at some of the larger outlying defense plants. Since Pearl Harbor, the number of such representatives has been materially increased. Many roads have also established military traffic bureaus to concentrate on this phase of their activities.

### Operating Changes

Naturally, the large increase in the number of operating employees has resulted in the appointment of many

**The Railways Broke All Operating Efficiency Records Last Year—They Must Exceed Those Records Again This Year**

more operating supervisory officers, such as assistant superintendents, terminal superintendents, trainmasters, assistant trainmasters, yardmasters, road foremen of engines, etc. New dispatching districts have also been established.

Some roads have gone still farther in that they have re-established as separate entities operating divisions that had been consolidated with other divisions during the depression. Such action has been particularly prevalent in the areas of intensive war production and military movements.

### All Transportation Departments Have Enlarged Personnel

Every railway transportation department in the country has felt the impact of wartime traffic and has enlarged its personnel accordingly. The radical changes that have taken place on many railways are well illustrated by the changes on the Southern Pacific, one of the roads that is in the midst of tremendous activity. On this road the superintendent of transportation was made general superintendent of transportation and his staff has been enlarged to permit 24-hr. a day, 7 days a week operation, and two assistant superintendents of transportation were appointed to give "around the clock" supervision. In addition, a superintendent of car service was appointed, with a staff of six district car service agents, to maintain close check of freight equipment and to expedite the release and movement of cars.

### Railway Men Assisting in War Production Drive

The railways have also been generous with their talent in assisting the government in every way possible. Not only have railway officers and men been recruited in large numbers for active service in the military railway units, but every railway has loaned men with special qualifications to the war production effort.

These men serve for crucial periods, or for the duration, as technical experts of all kinds in war production areas.

The railway industry was one factor in our national war economy that did not have to be converted. It was ready for the war production of vital transportation on December 7, as the result of years of preparation. Unless throttled by material shortages, the railway industry is prepared to carry on and to continue its record of perfect service to the Nation.

# Making Railway Service Adequate

(*Continued from page 975*)

well as for the building of freight cars, as to cause fear it will not only create a shortage of cars, but also prevent adequate expansion of even maintenance of signaling and other facilities no less essential to expanding, or even maintaining, total railway capacity.

However, the most discussed question in this connection is whether there will be enough freight cars during the rest of 1942 and especially in 1943. Nobody can make more than an educated guess regarding this. First, nobody knows how much traffic the railways are going to be called upon to handle. Second, nobody knows to what extent, if any, the War Production Board will increase its allocations of materials for railway purposes.

### Estimates of Freight Car Needs in 1942

Since the Association of American Railroads announced its estimates on May 12, 1941, that the number of freight cars should be increased by 120,000 between October 1, 1941, and October 1, 1942, and 150,000 between October 1, 1942, and October 1, 1943, there have been important developments tending to increase traffic demands on the railways more than was then anticipated. Submarine warfare has necessitated an increase in oil movement by rail to the Atlantic seaboard from 2,000 cars per week as recently as early in December to about 20,000 cars per week; and this oil movement by rail, which already is requiring the use of about 1,100 locomotives, is expected to be increased by 30 per cent. Reduction of coastwise steamship service has thrown an increasing coal movement from the Pocahontas region and other parts of eastern territory to New England on the railways, in addition to large tonnages of other freight previously moving by steamship between Pacific, Gulf and Atlantic ports. Most important of all, perhaps, is the probable effect of the rubber shortage in diverting highway traffic to the railways, a factor not considered until within recent months in estimates of prospective railway traffic.

### Greater Danger of Shortage in 1943

No authoritative estimate yet made has indicated that the railways would need delivery of less than about 120,000 new freight cars between October 1, 1941, and October 1, 1942. Apparently, under the restrictions imposed by the War Production Board, deliveries between these dates will not exceed 80,000. A definite shortage this fall is thus indicated on the basis of any authoritative estimate selected. And yet so great is the increase in the efficiency of freight car utilization that has thus far been secured, and that it is believed can still be secured by some of those who are best informed and whose past optimistic forecasts have been surprisingly fulfilled, that some of these best-informed men are not yet apprehensive of a serious general car shortage in 1942.

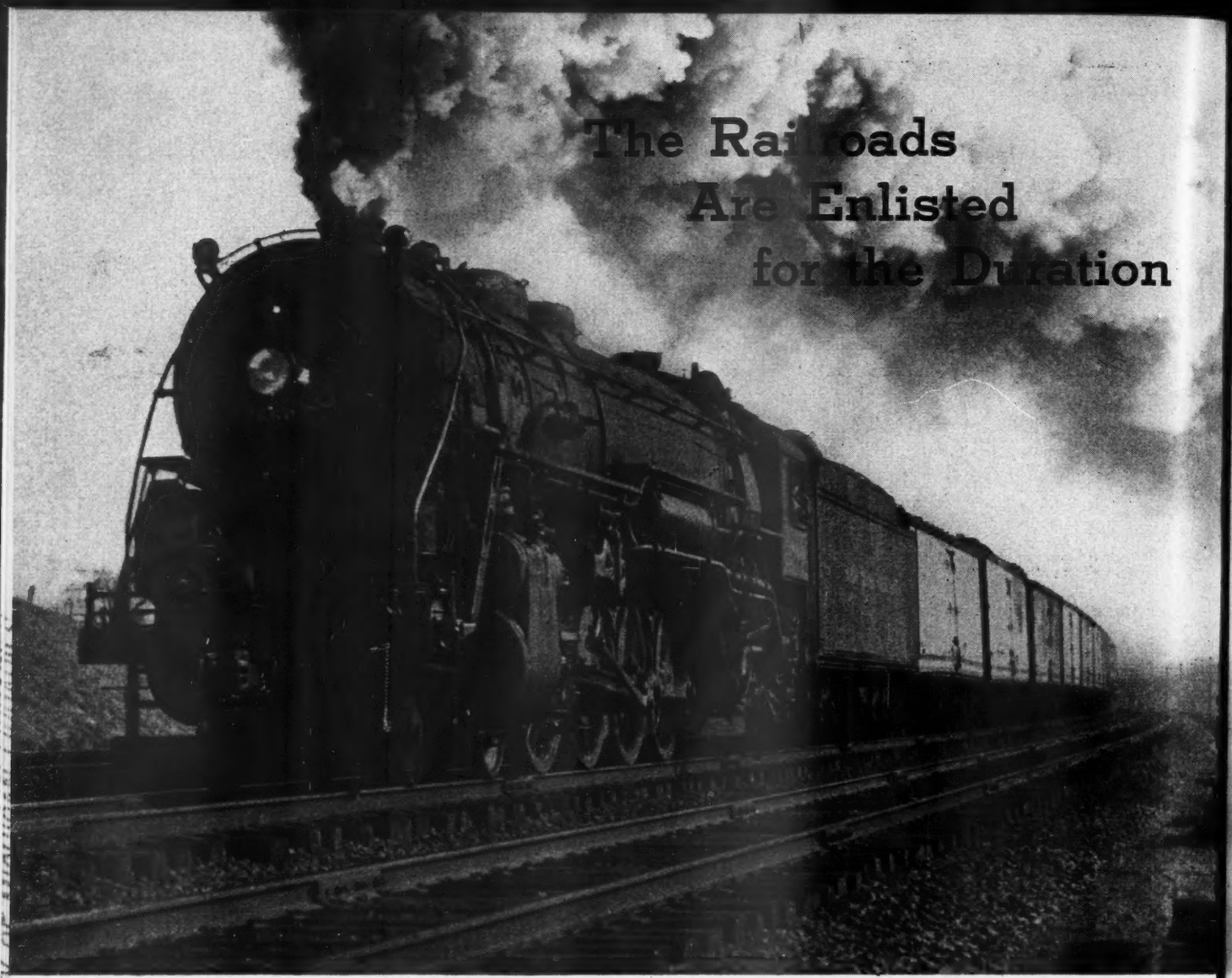
Even the most optimistic of these well informed, however, are looking forward with very real apprehension to 1943. For if there is to be need of such a large increase in the number of freight cars available in 1943, as all the well informed apparently agree, orders must be placed, materials furnished and construction on as many of them as practicable begun in 1942. And as yet there has been no indication from the War Production Board that it will make available early enough the materials required.

This is a "war of transportation." The principal bottleneck in the nation's war effort at present, in spite of the unprecedented records being made in shipbuilding, is lack of sufficient ships to carry to all parts of the world the vastly increased output of war material which the nation's industries can produce and its railways can move to the ports. At every seaboard port of the country, and even at numerous large interior storage points, there are piling up thousands of tons of material that have been produced by industry and moved by the railways. A similar insufficiency of ocean shipping developed during the last war; but fortunately in the present war freight for export has not been allowed to accumulate in thousands of cars at the ports, as was done during the last war with the result of artificially and unnecessarily reducing railroad capacity, but it is being unloaded as rapidly as practicable wherever storage space can be found—even on the ground.

### A Great Achievement Needed

Probably the imperative necessity of increasing shipbuilding is the principal cause of the inadequate allocations of materials for railway purposes. Let us hope, however, that the efforts being made to remedy the shortage of transportation by ocean will not result in the creation of a shortage of transportation by railroad. For, after all, it is as essential to provide enough land transportation for civilian and military purposes as to provide enough overseas transportation for military purposes.

The problem presented to railway managements and shippers, as well as to the Office of Defense Transportation and the War Production Board, is extremely complicated, difficult and full of uncertainties. But there is one thing about it which is certain, and this is that if, during the rest of 1942 and in 1943, there is going to be provided enough railway transportation it is going to be accomplished mainly by almost superhuman efficiency in the utilization of all available railway equipment and other facilities. If, in the circumstances, railways, shippers and the Office of Defense Transportation fail in their efforts to provide enough transportation, their failure will not be disgraceful or even discreditable. If they succeed, theirs will be an achievement equalling or surpassing anything else accomplished during the war.



# The Railroads Are Enlisted for the Duration

## Perfect transportation performance record is the goal which the Nation's carriers have set for themselves

RAILWAY transportation is vital to our war effort. This statement is so axiomatic that it would hardly seem necessary to repeat it here. Unfortunately, it is necessary to repeat it—to shout it from the housetops, in fact—because, in the very places where it should be understood best, it is apparently not understood and the ability of the railways to keep the Nation's transportation facilities functioning is being jeopardized today by this lack of understanding. It may well be that the trouble lies in the fact that the railways have been too good—that they have performed so effectively and so efficiently to date that they are regarded as capable of "lifting themselves by their own bootstraps." In any event, like the Israelites of old, they are, in effect, being commanded to make bricks without straw.

### Performance Records

That the railways have been "plenty good" is unquestioned. Let's look at the record. In 1941, the American railroads shattered previous records of efficiency and set up many new ones, despite the necessity of moving the unprecedented freight traffic of that year. Gross ton-miles per train hour increased from 16,555 in 1921 to 34,684 in 1941, or 109.5 per cent, while net ton miles per freight train hour increased from 7,506 in 1921 to 14,938 in 1941, or 99 per cent. These are new high records in both cases. Freight train performance per hour was approximately twice as good as in 1921, and freight trains were moved over the road nearly 1½ times as fast as in 1921. Freight locomotives in 1941 operated a daily average of 116.4 miles, also a new high record.

Likewise, greater utilization was obtained from freight cars than ever before. The ratio of freight cars in need of repair was reduced to the lowest figure on record; the average daily movement of serviceable freight cars was the highest ever attained; also the average load per car was greater than ever before. The average daily movement of *all* freight cars, including time spent in loading and unloading, was increased to 42.6 miles in 1941, a new high record and an increase of 65 per cent compared with 1921. Net ton miles per freight car per day were likewise increased to 795, also a new record, exceeding by far the previous high record of 664 ton-miles per day established in 1940.

On January 1, 1941, the railways had 108,972 freight cars in need of repair, or 6.8 per cent of their ownership. On January 1, 1942, there were only 62,200, or 3.7 per cent, cars in bad order, and on February 1, only 60,869 or 3.6 per cent, both new records, so low that they would

## *The Job Ahead*

**Gross and net ton miles per train hour; freight train speeds; daily car and locomotive mileages—all these and many more yardsticks of railway efficiency are at all-time highs.**

**In April, 1941, the railways moved 11,000 barrels of petroleum daily to the Eastern seaboard. They are now handling 600,000 barrels a day and may have to step this up to 800,000 barrels daily.**

**During the 1941 shipping season the railways handled more than 80,000,000 long tons of iron ore from the mines to the lake ports—an all-time record. They are preparing to move 90,000,000 tons this year.**

**War-time production is increasing rapidly. Materials are scarce and becoming scarcer. Still greater efficiency is essential if the job is to be done. It will be done.**

have been believed to be impossible only a few years ago. It should be noted, however, that this figure is now so low that further improvement is virtually impossible and that increased traffic will have to be handled in the future without this "cushion" of ability to reduce the number of bad order cars.

Fuel efficiency in freight service has a marked effect on car supply by reducing the number of cars required to handle the fuel consumed by the railways and by cutting down the number of cars held under load with company fuel. Despite the increased weight per train and the increase in the average speed of trains in 1941, the railways established a new low record of 111 lb. of fuel consumed in moving 1,000 tons of freight and equipment one mile. For each pound of fuel used in freight service in 1941, the railways hauled nine pounds of freight and rolling stock one mile. Twenty years ago, a pound of fuel moved only 6.5 tons, showing an increase in efficiency since 1921 of 46.3 per cent.

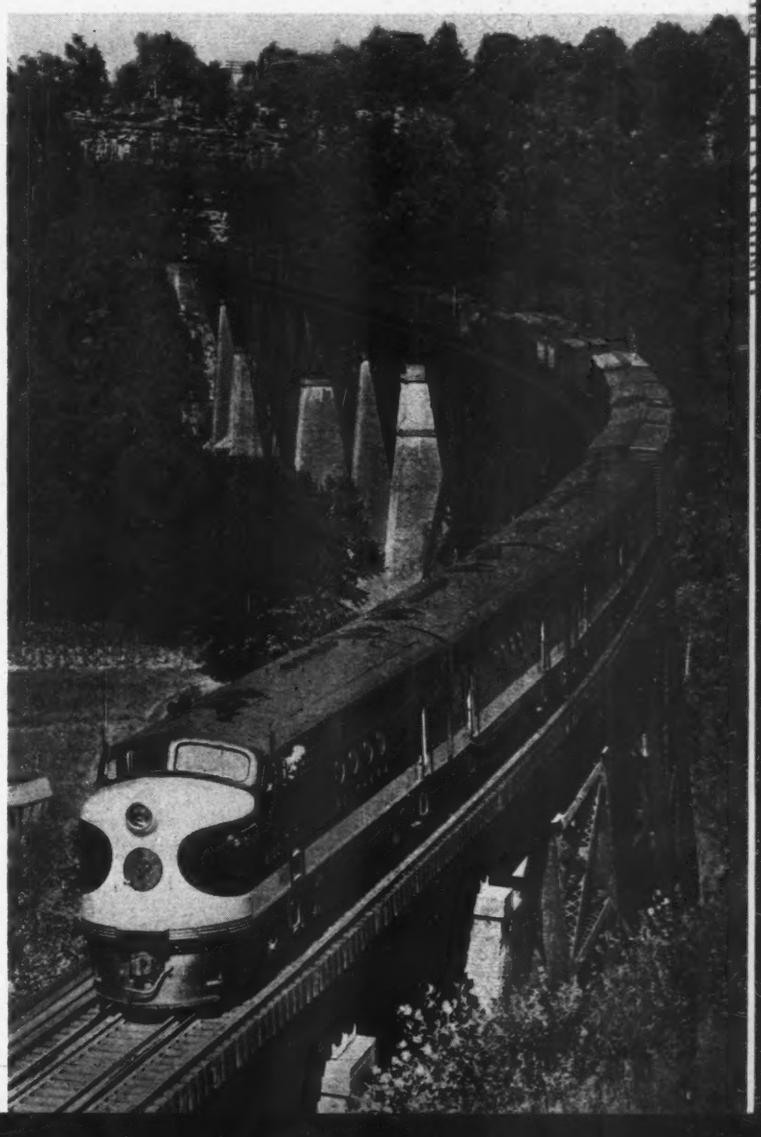
It should be remembered, too, that all this was accomplished during a year of unprecedented heavy traffic. Measured in terms of actual transportation produced, 1941 was a record year. The railways moved over 475 billion tons of freight one mile during the year, an increase of 27.3 per cent as compared with 1940. And this was an increase also of 6.26 per cent over the previous record year, 1929, when 447 billion tons were handled. What this actually meant was that the railways of the United States moved an average of 904,000 tons of revenue freight one mile every minute of the year and during the October peak period, they moved 1,069,000 tons a mile every minute.

The tremendous increase in tonnage handled and in the distance such tonnage was hauled produced new records of efficient operations on practically every railway in the country. The reduction in intercoastal shipping had made itself felt in increasing transcontinental traffic long before December 7, but, immediately thereafter, the flood of rush and emergency traffic doubled and tripled overnight. As terminal lines in California, the Southern Pacific, the Santa Fe and the Union Pacific bore the brunt of this unprecedented movement. The remarkable records they created for speed and efficiency under greatest stress are excelled in no other industry. All the western lines which form part of transcontinental routes are deserving of their share of credit in assisting in this remarkable performance.

The same problems were faced on a somewhat smaller scale by the roads serving the Pacific Northwest. The Northern Pacific, the Great Northern, the Milwaukee and the U. P. were all called upon to make superhuman efforts in handling traffic to Oregon and Washington. Without exception, they were able to meet all transportation demands.

The Southwest, too, became a beehive of transportation activity following Pearl Harbor. The numerous camps, training schools and other military establishments increased their inbound and outbound traffic beyond anything that could be expected. Such railways as the Missouri Pacific, the Katy, the Cotton Belt, the Texas & Pacific and the Frisco were called upon, without warning, for what appeared to be impossible feats of transportation. Without exception, they proved themselves equal to the emergency.

Of the roads operating west from Chicago that do not reach the Pacific Coast, the Burlington was called upon to participate in a major manner in the emergency move-



**New Power Is Contributing Much to the Railway's Record Performance**

**Left: The Railways Handled More Than Eighty Million Long Tons of Iron Ore in 1941. Below: A Vast Quantity of War Machines Are Being Transported by the Railways**

ments to the Southwest, to California and to the Northwest Pacific Coast, as well as in highly important movements in the territory in which it operates. Similarly, the Chicago & North Western has participated in movements to the entire Pacific Coast from Mexico to the Canadian frontier; while the Rock Island has been extraordinarily active in connection with heavy traffic to the Southwest and to the Coast. Highly important, too, as transcontinental links are the Soo line, the Minneapolis & St. Louis and the Denver & Rio Grande Western. All of these roads have created records for operating efficiency as far as their own lines are concerned. They have also assisted materially in handling the unprecedented transcontinental movement after Pearl Harbor.

Similar conditions in the Southeast, where military establishments are thickly clustered, placed a huge burden on the Seaboard, the Southern, the Illinois Central and shorter but important lines such as the Nashville, Chattanooga & St. Louis, A. & W. P., and G. M. & O. These and other railways had to revise their operations to meet the changed military conditions, and also to take care of business brought to the Gulf ports by steamship lines from Central and South America which had formerly carried the traffic directly to New York by water.

The coal carriers in the Pocahontas and contiguous regions found their problems tremendously multiplied. Fortunately, the Norfolk & Western, the Chesapeake & Ohio, and the Virginian to the south and the Western Maryland and Baltimore & Ohio in the more northerly coal fields, had all made huge investments in rolling stock, track, port facilities, etc., and were able to meet the test.

The Boston & Maine-Maine Central and the New Haven, serving industrialized New England found their problems highly multiplied. In quite a different manner from the railways in any other territory, operating methods had to be revised overnight to meet the flow of business. The B. & M. increased its average trainload 9 per cent compared with 1940, while the average trainload on the New Haven was 94 per cent better than the average during the last war.

The lines serving the territory east of Buffalo exclusively were already handling a large business. Accelerated war production piled another load on top of this. In addition, the Reading-Central of Jersey, the Lehigh Valley and the Lackawanna are all large coal carriers and have, besides, the problems of port traffic to consider. Shorter but important lines such as the New York, Ontario & Western, and the New York, Susquehanna & Western have played their part in moving traffic in heavily industrialized areas.

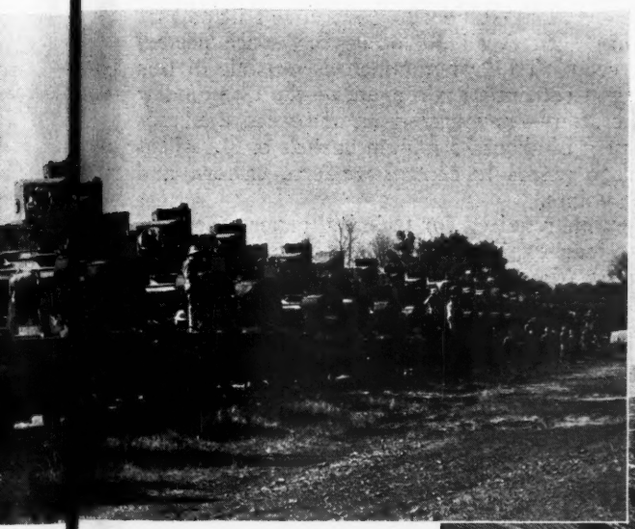
Such lines as the Pennsylvania, the New York Central and the B. & O., serving both the East and the Middle West, found themselves in a veritable maelstrom of traffic, coming and going in literally all directions at once. These huge transportation machines, however, showed themselves capable of bearing the shock of suddenly increased traffic and demonstrated this fact during the emergency. Other lines serving the Middle West, such as the Pere Marquette, the Nickel Plate and shorter lines such as the Wheeling & Lake Erie and Pittsburgh & West Virginia, were all creating new records for operating efficiency and contributing their share to the national war effort.

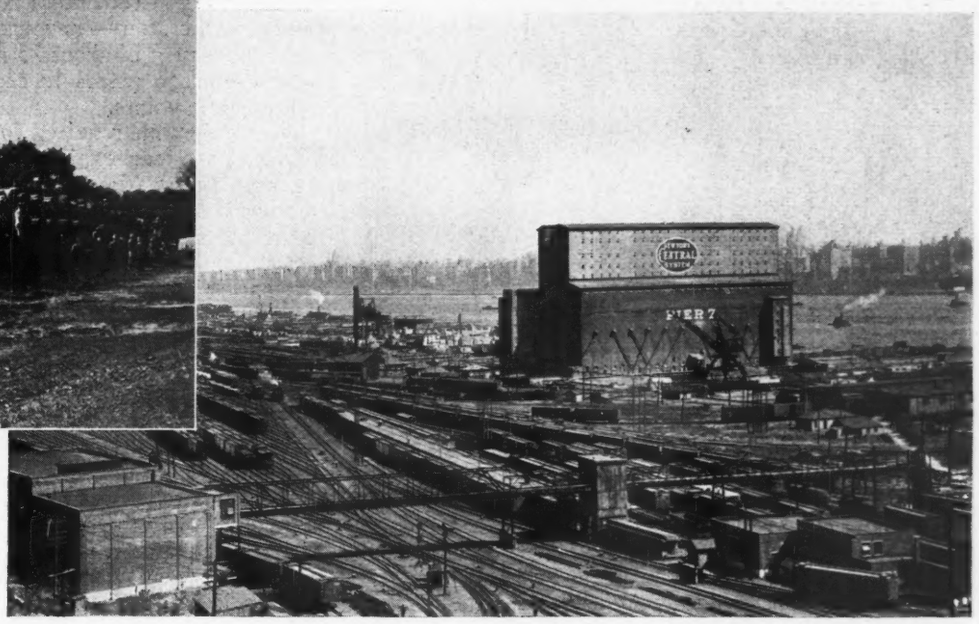
In marked contrast to the last war, when terminals were the bottlenecks of transportation, the terminal railways are today performing as efficiently as the trunk lines. The Chicago and St. Louis gateways, for ex-

ample, have remained in a completely fluid condition throughout the emergency. Such lines as the Elgin, Joliet & Eastern, the Belt of Chicago and other belt lines in the world's largest railway terminal have been operating so efficiently that not only is there no sign of clogging, but the movement of cars through this terminal is actually faster and more efficient now than ever before. In St. Louis, the Terminal Association has been assuring a similar situation by getting cars through that gateway, between the east and west bank lines in as short a time as three hours.

### The Equipment Situation

The secret of these records and many others like them is found in the proper handling of cars by both the railways and shippers and securing the maximum utilization of locomotives. The successful efforts of shippers in saving car days are outlined in another article, but there is much that the railways themselves can do, even though the present situation with respect to equipment in relation to expected traffic is none too encouraging, through no fault of the railways themselves.





**Right: Terminal Operations at Tidewater Have Been Materially Improved**

Studies concerning freight care adequacy are being conducted constantly by the Car Service division of the A. A. R. and recommendations made as to prospective requirements. Late in 1941, results of surveys based on prospective traffic requirements, trends, etc., indicated that the construction of about 114,000 new freight cars would be necessary between October 1, 1941, and October 1, 1942, with an additional 30,000 cars to be built in the last quarter of 1942. This was regarded as the minimum to provide adequately for commercial and military requirements and was based on the most authentic information available, obtained from men who definitely knew what they were talking about.

During the last quarter of 1941 and in January, 1942, some 32,900 new cars were installed. The S. P. A. B. then took charge and authorized the building of 36,000 freight cars during February, March and April, of which nearly 20,000 are still not installed, although the War Production Board has authorized the completion of the program. On April 8, the W. P. B. clamped down with the announcement that additional materials would be allocated for only 18,000 cars on or before October 1, 1942. A certain portion of these will be tank cars and it was recommended that the major portion of these cars be hoppers, gondolas and ore cars. What this means is that only about 85,000 new freight cars will be installed between October 1, 1941, and October 1, 1942, instead of the 114,000-car minimum set by people who know, a difference of nearly 30,000 cars.

Freight cars on order as of the time of the W. P. B. decree approximated 70,000, of which fewer than half will be built according to best estimates. The present total freight car ownership is about 1,718,100 cars, compared with 1,645,700 a year ago, an increase of some 72,400 cars, or 4.4 per cent. The present serviceable ownership is about 1,657,900 cars, or 96.5 per cent of the total, as compared with 1,543,000, or 93.8 per cent, a year ago, representing an increase of nearly 115,000 cars, or 7.4 per cent. It should be noted that the increase in serviceable cars is greater by nearly 43,000 cars than the increase in total ownership. One of the prime factors in producing this result was the railways' ability to reduce bad order cars. They cannot, however, continue this reduction indefinitely, nor can they hold the present ratio anywhere nearly where it is without the necessary materials for repairs.

The railways have so far maintained their perfect record by a wide variety of efficient practices in the handling of cars and locomotives. In car handling, they have been doing many things to save car days. Industries served by two or more lines no longer receive more than their actual car requirements. The vexing question of merchandise cars is now covered by O. D. T. order No. 1, but long before there was such an order, and, in fact, before there was an O. D. T., the railways were showing marked improvement in cars used by heavier merchandise loading. This has been brought about in many instances by the use of highway trucks in transfer service or on intercity routes, to eliminate the handling of lightly-loaded merchandise cars and to permit concentration of L. C. L. freight to certain distribution points. This has also eliminated the handling of merchandise cars to

**Coal Traffic Is Moving At Speeds Never Before Attained**

branch line points in many instances, an operation that was always a fruitful source of delays.

The inspection and repairing of cars have also been the object of close scrutiny, looking toward the avoidance of unnecessary delays. A. A. R.-Mechanical Division circular No. G. C.-1006, issued late in 1941, deals extensively with this subject. Adherence to the instructions outlined therein has resulted in material decrease in such delays.

Car distribution is rapidly achieving the status of an exact science. Agents and yardmasters are more alert now than ever where cars are concerned and are keeping themselves thoroughly informed as to the number and location of available cars and the types of commodity loading for which they are suitable. The protection of local requirements from local resources is being studied as never before to eliminate wasteful and unnecessary car mileage. Under present conditions, car distribution is no longer a matter of picking and choosing from among the numerous cars in yards and on sidings, as it was only a few years ago. It is now a complex problem, where delays are not only wasteful, but, in their sum total, dangerous to the national welfare.

## Box Cars

Box car requirements in 1941 continued the accelerating pace set in the two preceding years, but all demands were satisfied, both for defense traffic and civilian needs. Unusually close supervision over the distribution of cars was necessary, due both to heavy seasonal demands and to shifting traffic volume as a result of new war production industries and the diversion of traffic from water routes to rail. Through the addition of 44,807 new box cars and a reduction in bad order cars that more than offset retirements, there was a net increase of 45,405 serviceable box cars during the year. By reason of more active demand, a reduction occurred in the average ratio of box cars on home roads, the figure being 49.3 per cent at the end of the year compared with 60.8 per cent at the beginning.

The annual wheat movement always represents the most intense and concentrated large traffic volume of the year, and requires specialized and nation-wide preparation. The 1941 crop proved to be exceptionally large, 899 million bushels for the entire country. The situation was seriously complicated by the fact that the government program encouraging the accumulation of surplus stocks of grain resulted in a record carry-over of old crop wheat, 385 million bushels. Much of this old wheat was stored on Southwestern farms and in country and terminal elevators, subject to government loans that did not expire until April 30, occupying space needed for the new crop. To clear as much as possible of this storage, the government's grain agency—the Commodity Credit Corporation—inaugurated an unprecedented advance movement of about 75 million bushels of old wheat to new storage points in central western, eastern and southeastern points.

Due to the time required for technical paper processes, following the loan expiration date, this movement could not start before May 10, and the new crop was coming to harvest soon after June 1. Thus cars had to be prepared and distributed for an earlier than normal loading and measures taken to insure their prompt return to originating territory for handling the new crop. A considerable volume of this old grain was moved to Atlantic seaboard points, under this procedure the loads and returning empties being handled in solid trains and in record time. Many trainloads of wheat left Chicago for Baltimore and Philadelphia, were unloaded at elevators there and the empties delivered back to the Western lines at Chicago, all within five days turnaround time.

Even this relief was inadequate and new grain seeking storage to enjoy the comparatively high government loan rate soon exhausted the available terminal storage space. To control the movement and prevent congestion of grain in cars it was necessary to embargo the loading of all grain for storage except where space had been allocated in advance when consigned to Kansas City, St. Louis and Salina in the Southwest, Minneapolis and Duluth in the Northwest, and to Cincinnati, Louisville, Toledo, Philadelphia and Baltimore in the East, followed later by similar restrictions on Puget Sound ports. At other markets the imposition of embargoes was avoided only by closest co-operation between shipping and terminal interests.

Anticipating these conditions, early in the year the Car Service division advised the Department of Agriculture and various elements of the grain trade that while the railroads would provide cars for every bushel of grain that could be loaded and unloaded promptly, they would take measures to prevent any storage of grain (or, in fact, of any other commodity) in box cars at any point or under any circumstances. This promise was fulfilled literally and completely.

These unusual conditions developed new co-operative methods between all interests concerned. Following the advice above referred to, the Secretary of Agriculture

sponsored the establishment of grain marketing committees at all principal market points, composed of representatives of all elements of the grain storage and milling trade, country and terminal co-operative and independent, including also the railroads. These committees proved very valuable agencies in the assembling of information as to storage stocks and space and in regulating the movement of grain to market under the agreed terms of the railroad embargoes. Their service was so constructive that it is believed that these committees will become a permanent part of our grain marketing machinery.

Supplying sufficient box cars on western roads for this heavy burden of old and new grain movement provided an opportunity for the railroads to prove the effectiveness of the present system of freight car distribution. "Quota" orders for the reduction of western box cars on Eastern-Southeastern roads were issued early in April; to further stimulate the movement, a special order was issued in May requiring the return empty of western cars. Under this program, the number of western box cars on 35 of the principal eastern and southeastern railroads decreased 22,600 cars, or 35 per cent, between April 15 and July 1. There was a net increase during the same period of 50,445 box cars in western territory, including a gain of 35,922 ordinary box cars by 11 of the principal western roads directly concerned in the grain movement. In preparation for this traffic, there were accumulated at the high point 30,253 cars that had been inspected, repaired, made fit for grain and put on side tracks awaiting loading. It is difficult to conceive of a more effective emergency redistribution of cars under any practicable plan of handling.

Aside from wheat, soybean production is increasing in volume at such an amazing rate that it is becoming an important factor in transportation during September and October. The 1941 crop was 106,712,000 bushels, an increase of 38 per cent over 1940, and 200 per cent over the average of the previous ten years. Most of this production is in the four states of Iowa, Illinois, Indiana and Ohio, which results in a concentrated transportation and storage problem.

Also, each year the brief period for the shipping of watermelons is preceded by a season of enforced conservation of the ventilated box car supply. The 1941 volume was 12,847 cars, a reduction of about 10 per cent under 1940. There were no car supply complaints.

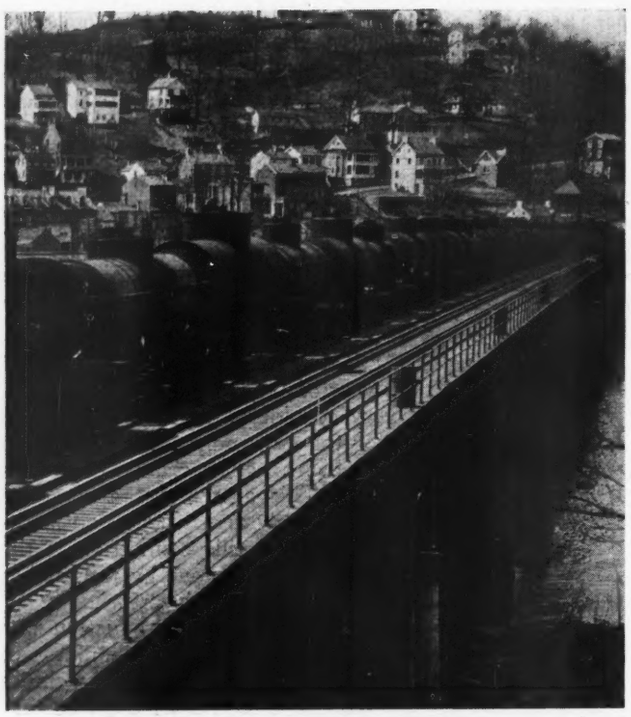
During the year 1941 the motor vehicle production in the United States was 4,838,561 machines, which was the greatest number produced in any year since 1929, when 5,359,000 cars were produced. The railroads handled 449,071 carloads during the year, which was the greatest number that they had been called upon to handle since 1937, when 453,804 carloads moved by rail. The production of trucks was also the greatest on record, numbering 1,094,261, which was an increase of 201,176 over the peak year of 1937, when 893,085 trucks were produced. A very considerable proportion of the 1941 production was for the government, most of which were of the army type, which meant a change in the ordinary loading practices. This also meant a complete revision of the normal car supply and distribution methods and an interesting factor in this connection is the Army's insistence that these trucks move by rail, rather than under their own power on the highways.

The major portion of the 1941 truck production was moved in cars specially equipped for the handling of automobiles. The larger types of passenger machines and the out-of-the-ordinary types of trucks required cars having either-end doors, in both 40-ft. and 50-ft. lengths. The handling of this business was accomplished without any serious difficulty and it was exceptional when there was not more than an ample supply of cars available to take care of the business offered.

### The Oil Movement

Especially noteworthy among the railway achievements of the last year has been the movement of gasoline and oils, more particularly in recent weeks. In April, 1941, the railways were moving about 350 tank cars of petroleum a week, or an average of 11,250 barrels daily, from the Mid-Continent and Mississippi Valley fields to the

This Diesel-Electric Operates Over the Mountains in Main-Line Freight Service



**The Railways Are Hauling 600,000 Barrels of Oil a Day to the Eastern Seaboard—Three Times Their Maximum Estimate of a Few Months Ago**

eastern seaboard; yet, in the week of April 18, 1942, the seventh consecutive week when records were broken, 18,651 cars were handled, or 599,500 barrels daily. At the same time, the movement from California to the Pacific Northwest has been built up from a few cars weekly last year to an average of 107 cars daily during the week of April 18.

The Car Service division has set up a Tank Car section to look after this movement, and the entire industry has co-operated to bring about this increase of several thousand per cent, made necessary by the withdrawal of tankers from the service. The manner in which this remarkable achievement was accomplished is outlined below. It indicates clearly the ability of the railways as mass transportation agencies to stand up under unexpected burdens when their competitors have failed.

The present tank car problems are largely concerned with the war transportation needs of petroleum and products, industrial alcohol and liquefied chlorine gas. Petroleum now requires about 80 per cent of the tank cars and the need is constantly increasing. There are now 143,140 tank cars in service, of which only 9,004 are railway-owned. Of the privately owned cars, 37,339 were designed for other than petroleum loading, although many of these have been diverted to the oil movement. The basis of the success of this remarkable movement has been the complete co-operation of the oil industry, other large users of tank cars, the railways, the tank car owners and the government. Some of the measures adopted are as follows:

Solid trains of loaded and empty cars are moved speedily on main tracks through yards and terminals without intermediate switching. Empties are blockbilled from the unloading points in large groups rather than individually, thus saving switching. The same blocking plan is used for distributing empties at the larger loading points to avoid unnecessary handling.

Direct routes are used instead of circuitous routes. The crude oil movement to Eastern cities is concentrated over one good route to each point, rather than being divided between two, three or four routes. This permits the handling of loaded and empty tank cars in trainload lots.

The railways have also constructed new tracks and other facilities at the loading and unloading points, while the private line car owners have placed car repair forces at the same points, to permit prompt terminal handling and unloading. Sunday and holiday switching and train service have been added by the railways, and shippers and receivers are being encouraged to load and unload cars as fast as possible and to work their men seven days a week if necessary.

The railway supervisors and field men from the Car Service division are keeping close checks on road movements at the principal gateways and in yards to see that tank cars, loaded or empty, are not delayed. Checks are also made while the cars are in the hands of shippers and receivers and in this, the railways are aided by the vigilance committees of the shippers regional advisory boards.

As a result of this performance, Petroleum Co-ordinator Ickes and his subordinates have ceased proclaiming that the railways could not do the job, and are now co-operating effectively in getting the job done. Even though the miles made per tank car per day have been increased from 45.3 in January, 1941, to about 75 miles at present, the job is not done. The railways may yet be called upon to handle 800,000 barrels a day to the East coast, which would require 60,000 tank cars in constant use in this one service. Experience of the past few months gives assurance, however, that with a continuance of the present complete co-operation between all groups involved, even this job can be done.

## Ore Movement

During the 1941 season, which extended from April until early in November, the railways moved 80,116,360 long tons of ore from the Minnesota and Michigan iron mines to the lake ports for transshipment to lake boats, and they could have moved much more except for shortages in boats and lack of room for stockpiles at the steel mills. The "bogey" set for the 1942 season is 90,000,000 long tons and, so far, it appears that the railways will easily reach or exceed that figure if limiting factors other than rail transportation do not interfere. Already, from the opening of lake navigation to May 1, the railways have hauled 8,585,740 tons of ore this year, as compared with 6,954,793 tons during the same period last year, an increase of nearly 24 per cent.

The Duluth, Missabe & Iron Range and the Great Northern handle the bulk of this tonnage. A large quantity also moves over the Northern Pacific and the Soo Line in a joint operation. Ore from Northern Michigan mines moves to lake ports over the Chicago, Milwaukee, St. Paul & Pacific, the Chicago & North Western and the Duluth, South Shore & Atlantic.

Through years of experience, these lines have developed practically perfect transportation machines. Efficient facilities load the ore into trains of modern cars, drawn by locomotives specially designed for this service, which embody all the improvements brought out through years of experience. Tremendous train loads roll down to the docks over rights of way specially constructed to stand up under the pounding of such heavy traffic. Huge transfer facilities are maintained at the lake ports, where the contents of the cars are dumped into the boats.

Operations at the Lake Erie ports, where the transfer

from boat to rail takes place, were also speeded up by efficient methods. The Bessemer & Lake Erie, which handles the preponderance of the ore from the port to the steel mills, showed a remarkable performance record, made possible only by the excellent condition of the rolling stock and the right-of-way. The other lines handling the lake-to-mill ore were equally efficient. On the whole, the ore movement represents as streamlined and efficient an operation as can be found anywhere in the world of transportation.

There is no possibility of a shortage of rail transportation for ore movement. Firstly, the railways have for years had spare capacity, even when every mine was working at its maximum. Secondly, the rail capacity is definitely greater than the boat capacity. The capacity of both mines and boats will be increased this year. The mines have materially augmented their men and machinery. Mr. Eastman has decreed that grain will not be moved on the Great Lakes to permit the use of more boats. Even so, the producing capacity of the mines and the handling capacity of the boats will still be below that of the railways and the latter will still be able to haul any amounts the mines can produce or the lake boats haul away.

**Long Freight Trains and Heavily Loaded Cars Are Increasing Transportation Output to New Levels**

## Perishables

In still another field, the railways have risen to new and extreme conditions brought about by the war in a remarkable way during recent months. This is the movement of perishables. Following the abandonment of coastwise and intercoastal ocean shipping, the interests of the vegetable and fruit growers have become especially closely related to the railways this year. Despite the burdens now being thrown on the transcontinental roads because of the cessation of intercoastal boat traffic, the customary precise, efficient perishable movement has taken place as usual. The problem of perishable car supply is always a complex one, but, this year, with hundreds of new destinations at outlying points, to provide perishables to our military forces in camps, the problem has been still more acute. It has been solved by close co-operation between the railways and the perishable food industry and by the fact that the plan for the distribution of empty refrigerator cars is basically a sound and efficient method that can be adapted to changed conditions.

Such major perishable handling lines on the eastern seaboard as the Florida East Coast, the Seaboard and the Atlantic Coast Line and other routes serving the southeast have felt the abandonment of coastwise shipping materially. Formerly, an average of 10 refrigerated boats sailed weekly from Jacksonville alone, and ordinarily, the traffic for these boats was moved from the growing territory to Jacksonville by highway truck. With the abandonment of boat service, these lines have the additional burden of expanded pick-up service as well as the greatly increased volume of line haul.

During the 1940-41 Florida citrus fruit season, through February 1, the boat lines handled 38.3 per cent of the movement to the eastern states, whereas up to February 1, they handled only 11.1 per cent, and the volume has since declined even more sharply so that in recent weeks, this has become practically a 100 per cent all-rail movement.

The huge increase in this traffic has been absorbed in expanded regular operations, despite the fact that, north of Jacksonville, both the A. C. L. and the Seaboard also have to serve many large camps along their lines. The effect of the increased perishable traffic is felt in the full by the Richmond, Fredericksburg & Potomac, which hauls all through Seaboard and A. C. L. perishables from Richmond to Washington and operates the joint terminal at Potomac Yards, Va., where this traffic is classified for delivery to the northern lines. This railway has been showing increases in freight traffic of as much as 100 per cent or more as compared with 1941 ever since January, 1942, and 1941 was considered a good year. So far, however, the R. F. & P., because of years of excellent maintenance of roadway and equipment, plus modern

**The Tremendous Ore Movement of 1941 Was a Transportation Epic—the Movement in 1942 Will Be Even Greater**

operating methods, has not reached its maximum capacity, either on the line or at Potomac Yards.

### Boat Traffic Diverted

The results of the abandonment of normal coastwise and intercoastal shipping have been felt by nearly every railway in the country. The following examples are selected at random to illustrate the widespread effect:

The Lackawanna has experienced a large increase in l. c. l. shipments from southern points that formerly moved by boat. On the contrary, the Norfolk & Western, which formerly handled considerable rail-water traffic through the port of Norfolk, has found that this traffic has almost entirely disappeared. In return, however, it is handling oil shipments and cotton linters from Texas to Virginia, which formerly moved by water. The Lehigh Valley notes a change in the preponderant direction of traffic from westbound to eastbound because of the transcontinental rail movement of freight which formerly moved from the West Coast to New York by boat and then inland by rail.

The Southern Pacific is, of course, affected very directly. No small part of the unprecedented increase in gross ton miles on this road is attributable to the removal of boat competition. In October, 1941, the S. P. showed an increase of 44.3 per cent in this figure over 1929; in November, 59.2 per cent, and in December, 83.6 per cent.

The New York Central finds a greatly increased demand for refrigerator cars for Florida loading, but notes that the elimination of coastwise shipping has also eased the situation at coastal ports by making more harbor floating equipment available for handling overseas freight. The Pere Marquette notes an increase in westbound traffic from New York and New England to the Pacific Coast. The Missouri-Kansas-Texas reports an increase in the all-rail movement of cotton from inland compresses, which formerly moved to the Gulf ports by rail for water movement beyond. The Louisville & Nashville has secured additional business from the North and Middle West to the South Atlantic ports and Florida, also business from the Gulf ports to the North and East.

The Boston & Maine reports increases in lumber, wood pulp, canned goods, dried fruit and imported wool eastbound as well as smaller increases westbound in textiles and manufactured articles; also in bituminous coal to New England. The Reading is now handling much coal that formerly moved via rail-water. The A. C. L. notes increases in cotton piece goods, merchandise and phosphate rock. The Northern Pacific moved about 25 per cent more carloads of forest products east in 1941 than in 1940. The Southern is handling forest products, pulp and paper northbound and merchandise and manufacturers southbound that formerly moved rail-water.

The D. & H. reports increased movements of bituminous coal, phosphate rock and sulphur northbound and manufactured products southbound as a result of the boat shortage. The Chesapeake & Ohio reports a change from rail-water on general merchandise through Hampton Roads to all-rail, but states that bituminous coal shipments via this route are affected relatively little.

There are many more examples of the fact that the railways have taken on this additional burden in their stride. All other agencies of transportation combined could not possibly have taken on this sudden burden, in addition to the tremendous wartime traffic, without completely breaking down.

### The Short Lines Aid

That important segment of American railroading, the short lines, has also been of material assistance. They, too, are being called on for unusual efforts in keeping the transportation machine in high gear. An example of this is found in the case of the Atlanta & Saint Andrews Bay, an 81-mile line operating between Dothan, Ala., and Panama City, Fla. Last summer, Panama City was selected as the site for a gunnery school. This was constructed as a permanent training unit, the buildings, runways and other facilities being of concrete, which called for thousands of tons of gravel, cement, etc. Although already a huge project, the plans were greatly enlarged before construction was completed, causing the traffic to the project to exceed all expectations.

The completion schedule on this project was such that the A. & St. A. B., the only railway serving Panama City, was called upon to move an unprecedented volume of traffic during the latter part of 1941, and the peak of this traffic moved during November. During this month this road handled 10,607 cars, as against an average monthly movement of 6,130 cars, an increase of approximately 73 per cent.

This created a serious problem of congestion, which was made more serious by the fact that few of the cars moving to Panama City under load could be loaded for the return movement. The normal traffic northbound from Panama City consists largely of gasoline from the

**Efficient Freight Handling Equipment Speeds Traffic In and Out of Cars**

marine terminals there, and pulpboard from the paper mill. Since this could not be handled in many of the cars which moved southbound loaded with construction materials for the gunnery school, empty cars had to be moved south to accommodate this traffic, while empties had to be kept moving out to prevent congestion.

The tremendous increase came almost without warning, and the A. & St. A. B. was able to give adequate service largely because of the fact that it possessed sufficient motive power, including two Diesel-electric locomotives which were built especially for combination switch and road service. The railway worked these engines in switching service all day in the yards at Panama City and then operated them with trains from Panama City to Dothan and return each night. By using both steam and Diesel-electric locomotives interchangeably in road and switching service, this movement was cleared up without congestion and the experience gained will be valuable to the A. & St. A. B. in handling the freight for a $66,000,000 shipbuilding plant at Panama City, contracts for which were signed on April 2.

In moving this vast quantity of freight, the railways have, on the whole, continued the high-speed freight schedules installed in recent years. To obtain this speed of handling and at the same time to avoid damage to freight, has presented a real problem. Loss and damage to shipments are always an annoyance to the railways and their customers alike, and represent an economic waste. In these days, when a damaged part may delay the production of a warship, a plane or a tank, the prevention of damage to shipments is of vital importance.

Education of employees in the elimination of rough handling has progressed rapidly during the last few years. Quite as important, the education of supervisors as to their part in the elimination of rough handling has also progressed. Now, an army of new railway employees must be taught how damage to lading may be avoided and that is most definitely the job of the supervisors. It is their job, too, to impress upon the management the need for changed and improved facilities which will make the elimination of rough handling easier for the men. A slight change in a track layout has been known to make a considerable change for the better in damage claims.

Much of the damage to freight takes place in yards and in freighthouses. Except for accidents, there is relatively little damage traceable to improper handling while the car is in road haul. This fact complicates the problem somewhat in that the shortage of experienced men is now being felt keenly in both yards and freighthouses. The new men must be trained, of course, but they must also be provided with such mechanical aids as are available.

The Freight Container Bureau has issued much literature dealing with the proper packing of freight, which is being made use of to good effect. For speed in freighthouse handling, good flooring and proper handling equipment are essential. More and more railways are taking advantage of such modern platform equipment as trucks, lift trucks and tractors, the efficiency of which has been improved vastly in recent years. These devices, plus the proper training of new men, insure the desired result of speed in freighthouse handling, safety to employees, and the elimination of damage to package freight. The demand for speed and the elimination of damage may seem to work at cross purposes. Nonetheless, many railways have found that, with proper methods and proper equipment, the two are by no means irreconcilable.

Any such survey as this dealing with the railways' performance under emergency conditions during the past year must necessarily bring one into agreement with the Missouri editor who recently said that the railways and the men who run them deserve a medal for outstanding service. So far they have met every one of the limitless and exacting demands made upon them for transportation under all-out war production conditions. However much any other war production phase might lag, the railways have gone ahead producing transportation when, where and in the quantities desired.

How long can it last? Unfortunately, there is a limit to even the ingenuity and resourcefulness of American railway talent. This limit has not yet been reached, but it will be reached unless the perfectly axiomatic truth that you can't handle freight without cars and locomotives and tracks eventually penetrates into the august councils where it will do the most good. That is the answer to the question: "How long can the railways keep it up?"

**Railway Operation in Mountainous Country Is Assisted by Heavy Power**

**A Coal Train on the Chesapeake & Ohio—Coal Car-Miles in the East Have Greatly Increased as the Result of Submarine Warfare**

# Are There Freight Cars Enough?

## New conditions modify traffic estimates—Curtailed building programs create critical situation

THE volume of railway freight traffic and the demands it would probably make on railway facilities has been the subject of several estimates, some made before and some since the beginning of the year. In its Annual Statistical Number the *Railway Age* estimated that the railways of the United States would need somewhere between 90,000 and 140,000 additional freight cars* on line to meet the probable peak requirements of carloadings during the Fall of 1942. This was based upon estimated total annual carloadings of 46,600,000 (10 per cent over 1941), the variation in number depending somewhat upon how the traffic was distributed through the year and upon whether the minimum ratio of active cars per weekly carload obtained in 1939 could be repeated or whether a more conservative minimum of 1.67, obtained in 1929, were to be assumed.

**Freight Cars Spend More Days in Yards and Terminals Than in Trains**

The A. A. R. on May 12, 1941, announced a program calling for a net increase of 120,000 cars between October, 1941, and October, 1942, and a net increase of 150,000 more cars between October, 1942, and October, 1943. This program was predicated on a carloading volume of 43,683,000 for 1942 and a further increase to 48,000,000 in 1943. These estimates were revised in January when, in their estimates of steel requirements for the year, the railroads included material for 121,827 new cars, about 92,000 of which were for delivery before October 1.

Joseph B. Eastman, director of the Office of Defense Transportation, is reported to have asked for material to permit the building of 130,000 freight cars during 1942.

Deliveries to the railways from October 1 to January 1 amounted to about 24,100 cars. Up to May 1, including the carry-over of orders undelivered on January 1, orders had been placed with the builders or for construction in railway shops for 98,000 cars. Thus, more or less independently of the general estimates which are cited above, the needs of individual railroads and private car lines as reflected in orders placed up to May 1 called for the delivery of 122,100 cars within the peak-to-peak year. Deducting 8,500 cars which will probably be removed from service permanently within the year, the delivery of these orders would have provided a net increase of 113,600 cars by October 1.

Under existing limitations placed on car building by the War Production Board, the gross increase in the number of freight cars which can be effected from October 1, 1941, until the end of 1942 will amount to about 87,000 cars. It is doubtful whether more than 80,000 of them will have been delivered by October 1. After deducting probable permanent retirements, the net increase will scarcely exceed 78,500 cars.

Compared with the most conservative of the estimates set forth above, this indicates a definite shortage. While no informed person would be inclined to predict with assurance that because of this shortage a failure of transportation is bound to result this Fall, neither would any informed person predict with assurance that such a failure may not occur. This is the more true because of changes which have taken place in the railway transportation situation that were not taken into account when these estimates were made.

### New Factors in the Transportation Situation

There is the effect, for instance, of submarine warfare. This has driven our tankers off the sea and thrown a tremendous volume of oil movement in tank cars on the rails, a movement which, starting at some 2,000 cars per week into the seventeen Atlantic states early in December, had increased to well over 18,000 cars per week by May 1 and was then handling only about one-third of the total daily requirements of the territory involved. Similarly, the movement of coal into New England is rapidly being transferred from tidewater to the rails.

* See the article, "How Many Freight Cars for 1942?", in the *Railway Age* for January 3, 1942, page 44.

While this movement probably will not increase the number of cars loaded, it will materially increase car-miles and car days per car loaded. This movement, which had reached about 300,000 tons a month by the beginning of May, will undoubtedly be largely increased. Before the year is over it will have claimed several thousand coal cars more than are normally required.

Another factor to which little, if any, attention was given in the estimates of 1942 car requirements is the prospective drying up of highway transportation because of the acute rubber shortage. This factor will probably be felt appreciably before the end of 1942.

Partially, at least, as the result of these unanticipated changes in traffic distribution, the traffic movement recorded during the first quarter of this year requires definite upward revisions of some of the factors affecting the demand for cars during the remainder of 1942. The *Railway Age* estimated that carloadings during 1942 would exceed those of 1941 by 10 per cent. This does not seem to be far out of line with the trend of the first 18 weeks. That estimate suggested, however, that ton-miles would increase by about 14 per cent. During January and February net ton-miles increased about 29 per cent over 1941. Revenue ton-miles per car loaded, which averaged 10,800 during the first quarter of 1941, increased to 11,900 during the fourth quarter, and during January ran at the rate of about 13,200. This reflects an increase in transportation service per car loaded of 22 per cent over the first quarter of last year and 11 per cent over the last quarter of last year. It now appears that the total ton-miles for the year may exceed the 1941 total by as much as 25 per cent.

### Heavier Loadings and Longer Hauls

The increasing transportation service per car loaded reflects two factors, both of which are rapidly changing so that their ultimate effect is difficult to evaluate. One is the increasing length of average haul which is throwing a heavy burden on the car supply. The other is the effect of increased tons per car through shipper-carrier cooperation and by the action of ODT.

An estimate of loaded car-miles per revenue car load indicates a haul of 394 miles during the first quarter of 1941; 412 miles during the fourth quarter of 1941, and 430 miles during January, 1942. Tons per loaded car increased from 27.6 during the first quarter of 1941 to 29.7 during the third quarter. While there has since been a slight recession from the third-quarter high average, this will undoubtedly be more than made up as the present year progresses. Indeed, acting upon General Order No. 1 issued in March by Director Eastman of ODT, the railroads effected a precipitant drop in the number of cars loaded with merchandise-l. c. l. of over 32,000 from March 21 to May 2. While the exact situation as to the l. c. l. tons loaded during this period is not entirely clear, there is little evidence to indicate any recession in the volume of l. c. l. traffic during this period. It reflects the action taken by the railroads even before the May 1 effective date of the order and augurs well for the ultimate increase in the average l. c. l. car load to over 12 tons contemplated by Director Eastman when the order was issued.

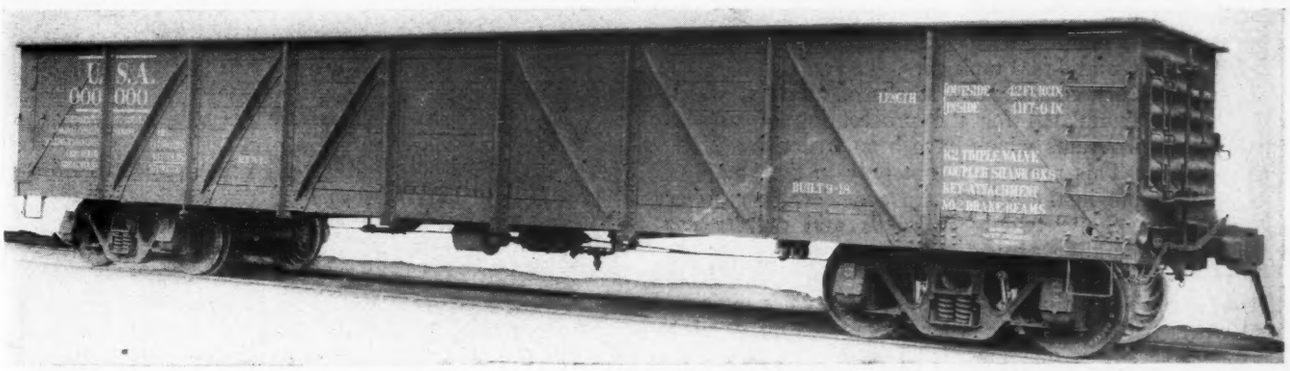
Numerous other economies in car time are being put into effect. Carrier-shipper cooperation is eliminating waste car days for loading and unloading; the railroads are giving attention to eliminating idle time in passing through yards and terminals, and ODT is studying the practicability of every suggestion which has been brought to its attention, few of which, however, are likely to develop major savings in car days.

Taken together, all these factors offer definite encouragement as to the outlook. There is, however, danger that too much weight will be given to them as substitutes for an adequate car supply to meet a prospective peak loading of a million cars a week next Fall. At the best, they can safely be considered only as favorable factors offsetting some of the unfavorable factors which are currently developing in an exceedingly uncertain situation.

### What Types of Cars Are Needed?

The war production program and the expansion of our armed forces have both created heavy new demands for open-top cars. New demands for gondolas are particularly heavy for the movement of raw materials, intermediate materials, and finished products for our armed forces and the lend-lease program. Army construction projects have also required setting aside substantial pools of open-top cars for heavy material movements which last for considerable periods. Flat cars, of which there are only 58,000 of railroad ownership, are also in particular demand in connection with military movements which require accumulations of these cars that are large in relation to the limited supply. There has also been some increase in the demand for refrigerator and ventilated box cars as the result of submarine warfare. Last year, for instance, the equivalent of nearly 20,000 car loads of perishables moved out of Florida by boat.

These demands on the particular types of equipment are partially reflected in recent freight-car orders placed by the railroads. In the table accompanying this article are set forth the orders placed during the first four months of 1942. The orders for railway ownership total 23,097 cars, of which 9,760 are hoppers, 2,130 gondolas, and 1,400 flat cars. The orders for box cars, of which




**A Reminder of the First World War—A Composite Gondola Such as This Has Been Suggested as a Means of Steel Conservation During the Present Emergency**

## Domestic Freight-Car Orders (Exclusive of U. S. Government Orders) Reported in the Railway Age During the First Four Months of 1942

| Date of issue | Railroad | No. | Type of car | Builder |
|---|---|---|---|---|
| Jan. 10 | Louisville & Nashville | 750 | 50-ton hopper | American Car & Fdry. Co. |
| | | 500 | 50-ton, 40½-ft. box | |
| | | 100 | 70-ton covered hopper | |
| | | 400 | 50-ton, 40½-ft. box | |
| | | 750 | 50-ton hopper | Pullman-Std. Car Mfg. Co. |
| | | 100 | 50-ton, 50½-ft. box | |
| | | 225* | 50-ton, 40½-ft. box | |
| | | 500 | 50-ton hopper | Pressed Steel Car Co. |
| | | 100 | 50-ton flat | Mt. Vernon Car Mfg. Co. |
| | Chesapeake & Ohio | 1,000 | 50-ton hopper | American Car & Fdry. Co. |
| Jan. 17 | New York Central | 3 | Transformer | Despatch Shops, Inc. |
| | Pittsburgh & West Virginia | 100 | 50-ton, 40½-ft. box | Company shops |
| Jan. 31 | Atlantic Coast Line | 1,100 | 50-ton auto-box | Pullman-Std. Car Mfg. Co. |
| | | 400 | 55-ton hopper | Bethlehem Steel Co. |
| | | 300 | 50-ton, 41½-ft. gondola | |
| | | 100 | 70-ton covered phosphate | |
| | | 100 | 50-ton, 53½-ft. flat | Greenville Steel Car Co. |
| | Chicago & North Western | 500 | 70-ton gondola | Bethlehem Steel Co. |
| | | 500 | 70-ton gondola | Gen. American Trans. Corp. |
| | | 500 | 50-ton, 40½-ft. box | American Car & Fdry. Co. |
| | | 250 | 50-ton flat | Pullman-Std. Car Mfg. Co. |
| Feb. 7 | New York, Chicago & St. Louis | 25 | 30-ton caboose | Magor Car Corp. |
| | Detroit, Toledo & Ironton | 50 | 70-ton flat | Greenville Steel Car Co. |
| | | 70 | 70-ton gondola | |
| | Norfolk & Western | 1,000 | 50-ton, 40-ft. box | Ralston Steel Car Co. |
| | Reading | 1,000 | 55-ton hopper | Company shops |
| Feb. 14 | Southern | 2,500 | 50-ton hopper | Pullman-Std. Car Mfg. Co. |
| | Pere Marquette | 250 | 70-ton flat | Greenville Steel Car Co. |
| | Delaware & Hudson | 12 | 50-ton box | American Car & Fdry. Co. |
| | St. Louis-San Francisco | 70† | 50-ton box | Company shops |
| | Nashville, Chattanooga & St. Louis | 50 | 50-ton covered hopper | American Car & Fdry. Co. |
| Feb. 21 | New York Central | 1,100 | 55-ton, 40½-ft. box | Despatch Shops, Inc. |
| | | 600 | 70-ton gondola | |
| | | 300 | 70-ton, 52½-ft. flat | |
| | | 500 | 55-ton hopper | |
| | Baltimore & Ohio | 1,000 | 50-ton hopper | Bethlehem Steel Co. |
| | | 1,000 | 50-ton box | Gen. American Trans. Corp. |
| | Chicago & North Western | 2 | 50-ton box | American Car & Fdry. Co. |
| | Central of Georgia | 100 | 50-ton box | American Car & Fdry. Co. |
| Feb. 28 | Lehigh Valley | 500 | 50-ton hopper | Bethlehem Steel Co. |
| | New York, Chicago & St. Louis | 50 | 70-ton covered hopper | American Car & Fdry. Co. |
| | | 50 | 50-ton flat | Pullman-Std. Car Mfg. Co. |
| | Nashville, Chattanooga & St. Louis | 250 | Hopper | Pullman-Std. Car Mfg. Co. |
| | | 25 | 50½-ft. box | |
| | Chicago, Rock Island & Pacific | 350 | 50-ton auto-box | Pressed Steel Car Co. |
| | | 300 | 50-ton flat | Company shops |
| March 7 | Nashville, Chattanooga & St. Louis | 50 | Covered hopper | American Car & Fdry. Co. |
| | Atlantic Refining Co. | 8‡ | 40-ton tank | Gregg Co., Ltd. |
| | Richmond, Fredericksburg & Potomac | 20 | 50-ton box | Pullman-Std. Car Mfg. Co. |
| | National Tube Co. | 98 | 70-ton gondola | Magor Car Corp. |
| | Linde Air Products Co. | 39 | 70-ton box | Gen. American Trans. Corp. |
| | Rubber Reserve Co. | 50 | 50-ton tank | American Car & Fdry. Co. |
| | Nashville, Chattanooga & St. Louis | 50 | 50-ton gondola | Bethlehem Steel Co. |
| March 14 | Grand Trunk Western | 200 | 40-ton auto-box | Pressed Steel Car Co. |
| | Union Pacific | 1,000 | 50-ton ballast | American Car & Fdry. Co. |
| | Central of Georgia | 50 | 50-ton hopper | Pullman-Std. Car Mfg. Co. |
| March 21 | Chicago, Milwaukee, St. Paul & Pacific | 35 | 70-ton covered hopper | Company shops |
| | | 35 | 70-ton mill-type gondola | |
| March 28 | Chicago, Rock Island & Pacific | 25 | 70-ton covered hopper | Gen. American Trans. Corp. |
| | Nashville, Chattanooga & St. Louis | 25 | 70-ton, 65-ft. mill type gondola | Greenville Steel Car Co. |
| | | 50 | 70-ton, 52½-ft. mill type gondola | |
| April 11 | Duluth, Missabe & Iron Range | 500 | 75-ton ore | American Car & Fdry. Co. |
| | | 500 | 75-ton ore | Gen. American Trans. Corp. |
| | | 500 | 75-ton ore | Pullman-Std. Car Mfg. Co. |
| | | 500 | 75-ton ore | Pressed Steel Car Co. |
| | Pittsburg & Shawmut | 100 | 50-ton hopper | Pressed Steel Car Co. |
| April 18 | Baltimore & Ohio | 25 | 50-ton hopper | Bethlehem Steel Co. |
| May 2 | Phelps Dodge Corp. | 190 | 90-ton ore | Western-Austin Co. |

*For the Atlanta & West Point.

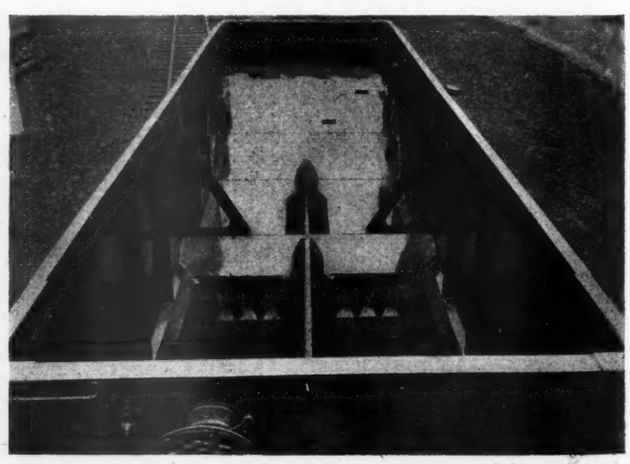
†Steel underframes, assembled car sides, and miscellaneous forgings ordered from American Car & Foundry Co.

‡For export to Brazil.

there are 6,779, are somewhat larger in number proportionately than the relative demands which are being created by war conditions.

The tentative breakdown of the 18,000 freight cars for which WPB has allocated material during the last eight months of 1942 is 5,750 hopper cars, 5,750 gondola cars, 2,500 flat cars, and 4,000 tank cars.

There are very considerable stocks of material which have been accumulated for the prosecution of various car-building programs which have been frozen by WPB order L97-a. This material is not only in the hands of the builders, but in the stocks of a considerable number of railroads. Some twenty railroads and private car lines had car-building projects under way calling for the delivery of approximately 30,000 freight cars during 1942. Many more than half of these cars were undelivered when WPB's freezing order was issued on April 4. Considerable stocks of materials are now carried in the inventories of these railroads for the continuance of these programs, a large part of which is of no value except on



**The Cubical Capacity of Steel Open-Top Cars Is Enlarged by Applying the Sheathing Outside the Frame Members**

the particular types of cars for which it is intended. Some of this material was purchased by the railways in fabricated form ready for assembly in the railway shops.

In most cases additional material is required to permit completion of the cars, but such items usually represent relatively little tonnage. Failure to provide them and to permit the continuation of such programs to the extent that material stocks will permit is wasting material, man power, and car-building capacity.

### Substitution of Wood for Steel

Consideration has been given to the substitution of wood for steel in freight cars. There seems to be little disagreement as to the possibility for an appreciable reduction in the amount of steel required in box cars by a return to the wood-sheathed type of car. The saving in sheets is considerable but is offset to some extent by the requirements for an increase in the weight of the structural frame members.

In the case of hoppers and gondolas, however, the wood sides, placed inside the frame members, effect a sufficient reduction in cubical capacity as compared with that of steel cars, the sheets of which are placed outside the frame, so that there is no reduction—indeed, there is probably some increase—in the amount of steel required to produce the same coal-carrying capacity. Considering the relative needs for open-top and box cars and the inventories available for box-cars, the prospects for appreciable relief from such substitution are not great.

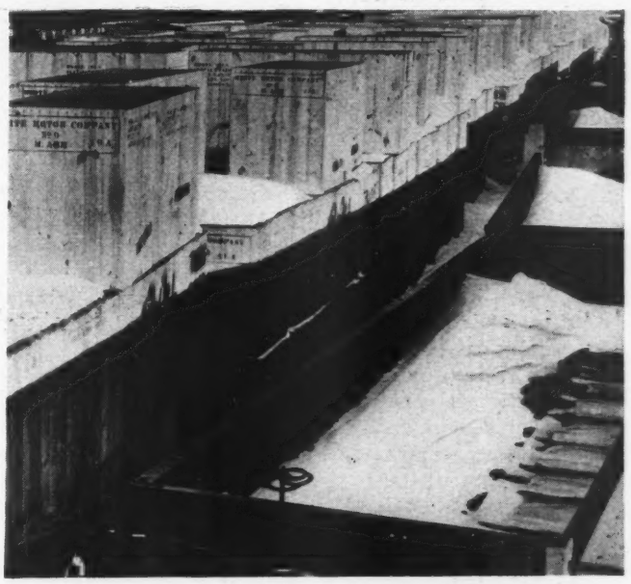
### What Are the Prospects for Next Fall?

Even though the estimate of a 10 per cent increase over the carloadings in 1941 is exceeded this year, maximum loadings much in excess of one million cars per week do not seem probable. The period of maximum weekly loadings, however, may be relatively longer this year than last. Four weeks have usually encompassed the annual Fall carloading peaks. Last year the peak was of about eight weeks' duration. The period may be considerably longer than eight weeks this year.

This and a number of other factors which have already been discussed affect the prospects for a low ratio of car loads to cars on line. An extended period of maximum carloadings will tend to increase the number of cars in bad order, particularly should there be any difficulty in securing prompt delivery of materials needed for repairs once the strain of maximum loading begins to be felt. During October, 1941, the percentage of cars undergoing or awaiting repairs stood at 4.4—about 73,000. Since January 1 the percentage has varied from 3.5 to 3.8—from 60,000 to 63,000 cars. During the Fall peak of 1929 bad orders ran just under 6 per cent.

Last Fall 93 per cent of cars on line during October were active; that is, 6.9 per cent were surplus and awaiting repairs. To assume the maintenance of a higher percentage of active cars during an extended period of maximum carloadings would certainly not be conservative. Furthermore, in consideration of the many new factors affecting the frequency with which active cars may become available for loading, it would seem unsafe to expect that fewer active cars can be maintained per weekly car load than the 1.67 of the 1929 peak, which has been lowered only once since (in 1939).

To meet a maximum loading of one million cars per week under these conditions would require about 1,800,000 cars on line—over 60,000 cars more than it now seems will be available.

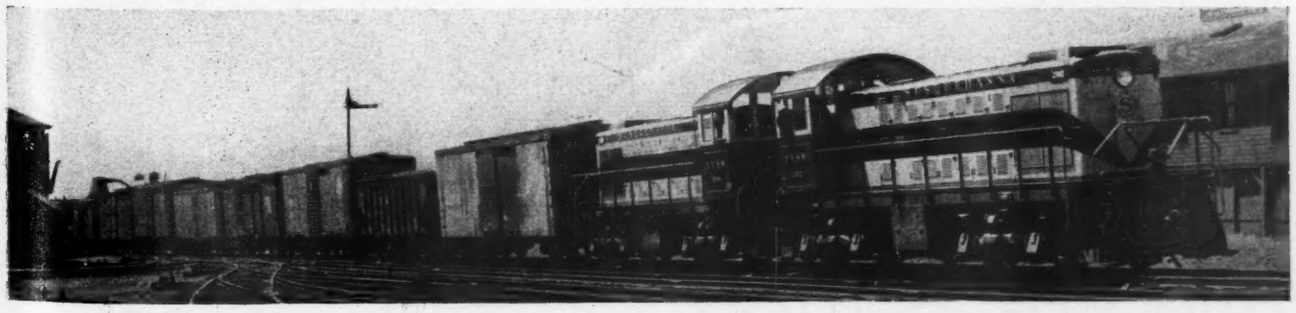


**A Mistake of the First World War That Is Not Being Repeated Now —When Ships Are Not Immediately Available, Lend-Lease Material Is Promptly Unloaded onto the Ground, Releasing the Cars for Transportation Service**

In conclusion, it should be repeated that no assumption is here made that such a statistical shortage will inevitably result in a serious transportation failure. It is just as evident, however, that, in assuming that no failure will occur, which is implied in its denial of materials for the completion of an adequate car-building program, WPB has assumed a grave responsibility and incurred a serious risk of a failure which, if it occurs, will inevitably disrupt its own war production program.

With this shortage as a starter, prospects for 1943 are distinctly not favorable.

* * * *



**Alco-G. E. Diesel-electric Freight Locomotives in Service on the New York, Susquehanna & Western**

# More Freight Power Required for Fall Traffic Peak

## With a net increase of only two per cent in locomotives by next October, the railroads will be asked to handle at least 20 per cent more ton-miles than in 1941

ANY consideration of the adequacy of present road freight and switching locomotives to handle the expected peak traffic load next Fall, to say nothing of what may develop in 1943, requires some study of freight traffic trends. All indications point to substantial increases. Steel production, for example, now exceeds that of last year by about four per cent and the total 1942 output may reach 86,000,000 tons. More agricultural products are being shipped abroad; coal and ore production is up nearly 10 per cent; the Federal Reserve Board index of industrial production averaged 156 in 1941 and is expected to show an increase of at least 15 per cent in 1942.

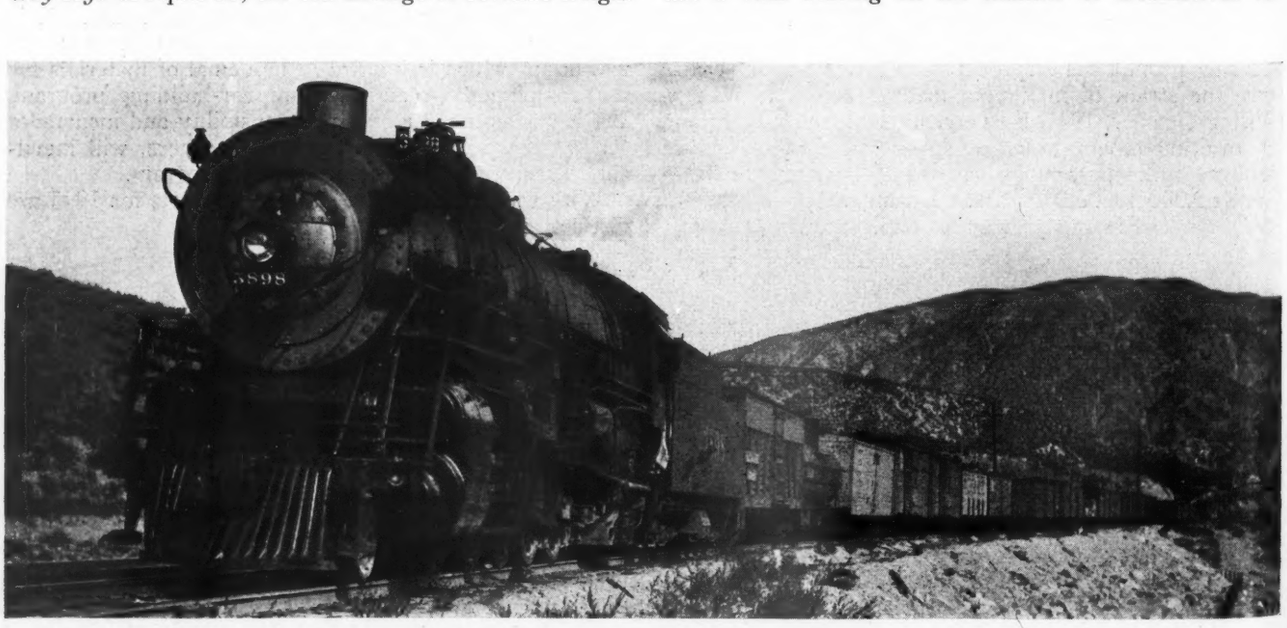
Weekly freight carloadings totaled over 42,000,000 in 1941, reaching a peak of about 920,000 in the third week of October. Shippers' Advisory Board estimates, which usually prove remarkably accurate, forecast an increase of 8.1 per cent in the first quarter and 14.6 per cent in the second quarter of 1942, as compared with 1941. These figures point to the probability of a weekly peak loading of at least 1,000,000 cars next Fall, and stepped-up production in 1943, accompanied by added diversion of water- and highway-borne traffic to the rails, will probably bring about a further general increase of about 10 per cent next year.

But weekly carloading figures do not reflect the true picture of increased equipment requirements, either as regards motive power or cars, since they fail to show the influence of heavier loading and increased trip mileage. As pointed out in the leading editorial in the *Railway Age* of April 25, the ton mileage of revenue freight handled in January, 1942, was 23 per cent greater than in January, 1941, whereas the number of carloads increased only 11 per cent in the same period. Obviously, weekly carloadings no longer give a real measure of transportation service or car and motive-power needs, which must be evaluated in the light of substantial increases in average loads per car and average trip mileage.

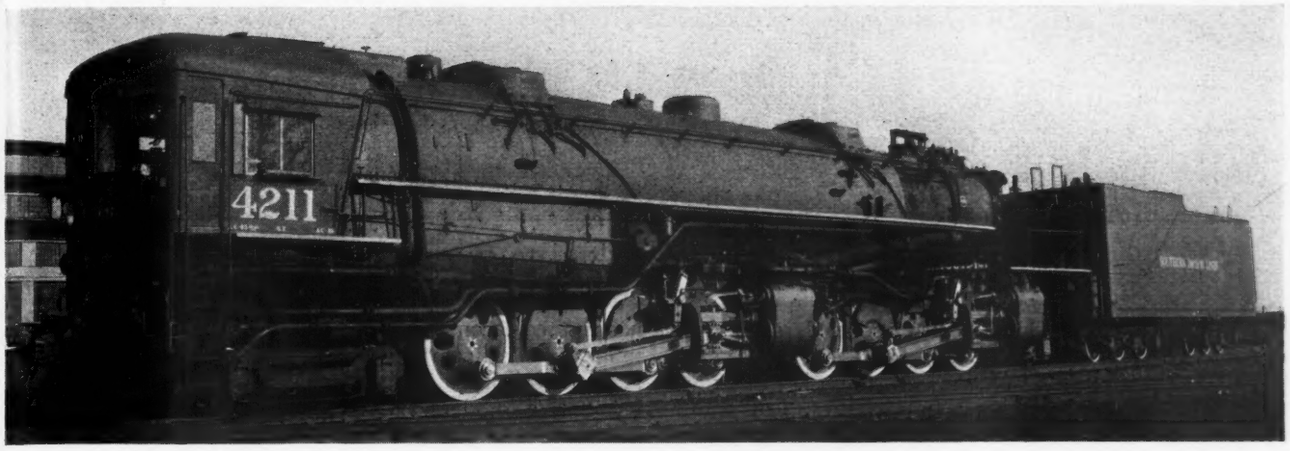
### Locomotive Orders in the First Four Months of 1942

Some idea of the estimate which individual railroads put on their own motive-power requirements is afforded by the accompanying list of domestic locomotive orders, exclusive of U. S. government orders, as reported in the regular weekly issues of the *Railway Age* during the first four months of 1942. This list includes a total of 344 locomotives, of which only four are passenger locomotives, 111 freight locomotives, 102 passenger and freight locomotives, and 127 switching locomotives. Classified in another way, the list includes 199 steam locomotives, 140 Diesel-electric locomotives, and 5 electric locomotives. Although a considerable number of Diesel locomotives and more than 50 steam locomotives were reported to have been ordered during the latter part of April in addition to those set forth in the accompanying list, the railroads involved have not confirmed that government approval has been received and these orders, consequently, are not included in the four months' total.

The percentage utilization of locomotive equipment has a vital bearing on the number of locomotives re-



**Mixed Freight Train in the Western Mountains**




**Baldwin-Built Freight Locomotive on the Southern Pacific**

quired to handle a given amount of traffic and the railroads have already shown what can be accomplished along this line, to such an extent that it is doubtful if sufficient further improvement can be effected to make up for the deficiency in new equipment.

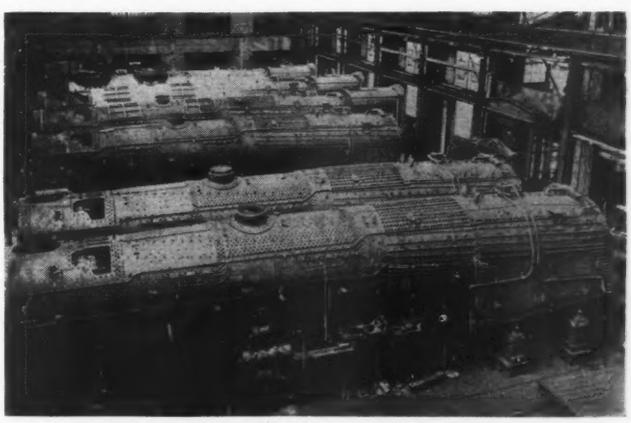
### Trends in Locomotive Ownership and Use

At the time of the 1941 peak the I. C. C. reported 21,830 locomotives assigned to freight service and 13,144 to yard switching service. From October 1 to the end of March, Car Service Division reports indicate that 388 new locomotives were installed on the Class I railroads, of which 153 are freight, or passenger and freight, locomotives and 179 switching locomotives. Orders reported by the *Railway Age* since January 1, and the carry-over of unfilled orders at the beginning of the year amount to 856 locomotives, about 460 of which are switching locomotives. This is 370 fewer than the total number of locomotives for which material allocations from SPAB or WPB are outstanding. As these allocations are intended to take care of army orders and orders for industrial locomotives, as well as those for the railways, present allocations will provide for very few more railroad orders this year and the very best that may be hoped for in 1942 is that these 856 locomotives may be delivered within the peak-to-peak year.

It may be assumed, then, that during the year from October 1, 1941, to October 1, 1942, the railways will have received a total of not more than 1,064 new locomotives, of which about 530 will be freight, or passenger and freight, locomotives and 430 switching locomotives. The changes in the freight and switching locomotive supply for the peak-to-peak year are set forth in the table which presents, if anything, an over-optimistic view of the probable new locomotives which will be available. The number of locomotives so arrived at are freight, 22,200, and switching, 13,500. The average tractive force of the freight locomotives will probably have increased somewhere between one and two per cent during the year.

In estimating the car-miles which may be expected with a maximum loading of a million cars a week an increase of car-miles per car loaded of about 10 per cent over last Fall may be anticipated. This ratio has been increasing for several years and the rate of the increase has recently been accelerating. Thus, the car miles will run at 3,220 million a month during the peak, an increase of 19 per cent over October, 1941. At the highest ratio of car miles per locomotive mile yet attained (October, 1940) and assuming that 82 per cent of the locomotives are active (80 per cent were active last October, and the figure has gone to 81 since), the situation will call for an average of 3,730 miles a month from the active locomotives. This is an increase of more than 11 per cent over the average attained last year. At that average it would require 2,100 more active locomotives and 2,600 more locomotives assigned to freight service to meet the situation.

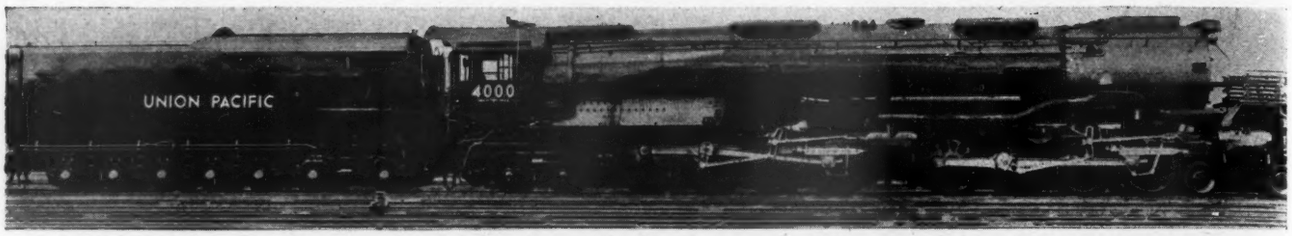
The need to effect an average increase in individual locomotive mileage of 11 per cent over last Fall's high which was, in turn, about 9 per cent higher than 1940, clearly indicates an exceedingly tight motive-power situation—one which will severely tax the ingenuity of motive-power and operating officers.



**Group of the New Chesapeake & Ohio 2-6-6-6 Locomotives Being Built at the Plant of the Lima Locomotive Works, Inc.**

Similarly, to meet the same conditions of car mileage, a marked increase in switch-engine utilization over any which has heretofore been attained will be required. Depending on whether the index is taken as the number of switching locomotive hours per 100 car miles or the number of switching locomotive hours per car loaded, the 13,500 switch engines will have to average 13.7 hours a day or 12.6 hours a day. A median value will be close to actual conditions. The highest average—that of October, 1941—is 11.9. Diesel switchers average about 19 hours a day, but the 400 new ones which may have been added to the inventory by next October are not sufficient to affect the general average greatly.

While most of the new locomotives ordered and authorized are of the Diesel switching type which can do more




**Heavy, High-Speed, Articulated, Alco-Built Locomotive on the Union Pacific**

work than the steam locomotives replaced, and some of the latter may be transferred to other service, the present level trend in locomotive ownership is in marked contrast to the sharply rising characteristics of all traffic trends as the studies above have indicated. It, therefore, seems obvious that earlier A. A. R. estimates of 700 new freight locomotives and 500 new yard locomotives which the railroads would need to install in 1942 were more than conservative.

### War Traffic Changes Boost Motive-Power Requirements

A good example of the way in which developments, usually associated with the war, bring unexpected demands for freight service, including the motive power and cars required to handle it, is afforded by the all-rail movement of oil to the Atlantic seaboard. This has grown from 165,000 barrels a day to over 600,000 barrels a day and the need for more is acute.

has limited locomotive production during the last twelve months. Steam locomotive output can be stepped up markedly if this material is received on schedule. With locomotive builders supplying boilers and fireboxes, the railroads can build part of their needed new locomotives in their own shops. In view of the tight freight motive-power situation which confronts the railroads this Fall and which will apparently extend into 1943, it seems obvious that every effort should be made to complete promptly the construction of locomotives already authorized, increase the authorizations to the fullest extent practicable within the limits of A. A. R. recommendations, and convert no more locomotive building space to the production of war goods, which are valueless without adequate motive power for the movement of these goods to the seaboard.

In order that the locomotive building plant capacity still available to the railroads may be used effectively plans for formulating the motive-power needs of the railroads for 1943 should be gotten under way without

**Changes in Freight and Switching Locomotive Supply October 1, 1941-October 1, 1942**

| | Freight and freight or passenger locomotives | | | | Switchers | | |
|---|---|---|---|---|---|---|---|
| | Steam | Diesel-elec. | Electric | Total | Steam | Diesel-elec. | Total |
| New locomotives installed Oct. 1-Dec. 31, 1941 | 54 | 19 | 2 | 75 | .. | 106 | 106 |
| Orders reported in Ry. Age Jan. 1-Mar. 31, 1942, plus orders on hand January 1* | 385 | 70 | 5 | 460 | 15 | 310 | 325 |
| New locomotives installed Oct. 1, 1941-Oct. 1, 1942, if deliveries are completed | 439 | 89 | 7 | 535 | 15 | 416 | 431 |
| Locomotive retirements will probably not exceed | 180 | .. | .. | 180 | 50 | .. | 50 |
| Net additions | 259 | 89 | 7 | 355 | –35 | 416 | 381 |
| Locomotives assigned October 1, 1941 | .. | .. | .. | 21,830 | .. | .. | 13,144 |
| Locomotives available October 1, 1942 | .. | .. | .. | 22,185 | .. | .. | 13,525 |

* Distribution as to types estimated.

Similarly, the all-rail movement of coal into New England will lengthen the rail haul of coal traffic. This amounted to 200 cars a day on the last of April and is going higher.

These two unexpected effects of the war alone are requiring the services of more freight locomotives than are called for by the earlier A. A. R. estimates previously referred to.

A consideration of all the facts leads to the conclusion that the railroads need every possible help not only in improving the mechanical condition of existing freight motive power, securing the maximum efficiency in motive power use and being permitted to buy or build the additional locomotives so urgently required. Commodities, such as sugar and coffee, may be rationed to the public without adverse effect on the war effort, but it is hazardous to consider railway freight power in the same light. Materials for both maintenance and new locomotives are essential to avoid delaying war materials, with attendant waste and inefficiency in plant operation.

Difficulty of obtaining materials, such as firebox steel, delay so that orders may be placed and material released to the builders. Unless this is done, either a waste of facilities or their loss to the railways is going to take place, between completion of the 1942 program and the beginning of the 1943 program.

### Locomotive Specialties Play Important Role

Another vital consideration is adequate provision for the construction and application of various specialty devices which, in varying degree, contribute to the capacity and efficiency of locomotives. It would be a serious mistake to give a lower priority rating or less favorable material allocation to those devices which have proved their merit than to the locomotive itself. Some of these devices actually produce a net saving in materials, based on what would be required to build equivalent capacity in locomotives unequipped.

A good example is afforded by poppet-type valves to control steam distribution on the steam locomotive. In a typical 4-8-4 type locomotive the light weight of the loco-

## Domestic Locomotive Orders (Exclusive of U. S. Government Orders) Reported in the Railway Age During the First Four Months of 1942 *

| Date of issue | Railroad | No. | Type | Builder |
|---|---|---|---|---|
| Jan. 17 | Chesapeake & Ohio | 15 | 0-8-0 Switcher | Lima Locomotive Works |
| Jan. 24 | Stone & Webster | 1 | Diesel-elec. sw. | General Electric Company |
| | Sanderson & Porter | 2 | Diesel-elec. sw. | General Electric Company |
| Jan. 31 | Southern | 2 | Diesel-elec. freight | Electro-Motive Corporation |
| | Remington Arms Co. | 1 | Diesel-elec. sw. | General Electric Company |
| | Wabash | 1 | Diesel-elec. sw. | Baldwin Locomotive Works |
| Feb. 7 | Lake Champlain & Moriah | 1 | Diesel-elec. sw. | Electro-Motive Corporation |
| | Bethlehem Steel Co. | 1 | Diesel-elec. sw. | General Electric Company |
| | Chicago, Rock Island & Pacific | 5 | Diesel-elec. freight | Electro-Motive Corporation |
| | | 8 | Diesel-elec. sw. | Electro-Motive Corporation |
| | | 4 | Diesel-elec. sw. | American Locomotive Company |
| Feb. 14 | New York, New Haven & Hartford | 5 | Electric-freight | General Electric Company |
| Feb. 21 | New York Central | 25 | 4-8-2 freight | Lima Locomotive Works |
| | | 2 | Diesel-elec. pass. | Electro-Motive Corporation |
| | | 10 | Diesel-elec. sw. | Electro-Motive Corporation |
| | | 17 | Diesel-elec. sw. | American Locomotive Company |
| | | 3 | Diesel-elec. sw. | Baldwin Locomotive Works |
| | Nashville, Chattanooga & St. Louis | 5 | Diesel-elec. sw. | American Locomotive Company |
| | St. Louis Southwestern | 3 | Diesel-elec. sw. | Baldwin Locomotive Works |
| Feb. 28 | Atchison, Topeka & Santa Fe | 10 | Diesel-elec. freight | Electro-Motive Corporation |
| | Lehigh Valley | 5 | Diesel-elec. sw. | Electro-Motive Corporation |
| | | 5 | Diesel-elec. sw. | American Locomotive Company |
| | New York, Chicago & St. Louis | 10 | 2-8-4 freight | Lima Locomotive Works |
| | Union Pacific | 30 | 4-6-6-4 freight | American Locomotive Company |
| Mar. 7 | Northern Pacific | 10 | 4-8-4 frt. and pass. | Baldwin Locomotive Works |
| | | 12 | 4-6-6-4 frt. and pass. | American Locomotive Company |
| | | 3 | Diesel-elec. freight | Electro-Motive Corporation |
| | Denver & Rio Grande Western | 10 | 4-6-6-4 frt. and pass. | Baldwin Locomotive Works |
| | St. Louis Southwestern | 5 | 4-8-4 frt. and pass. | Company shops |
| Mar. 14 | Denver & Rio Grande Western | 6 | Diesel-elec. freight | Electro-Motive Corporation |
| | Delaware & Hudson | 15 | 4-8-4 frt. and pass. | American Locomotive Company |
| Mar. 21 | Southern Pacific | 30 | 4-8-8-2 pass and frt. | Baldwin Locomotive Works |
| | | 10 | 4-8-4 pass. and frt. | Lima Locomotive Works |
| | | 30 | Diesel-elec. sw. | American Locomotive Company |
| | Richmond, Fredericksburg & Potomac | 10 | 2-8-4 frt. and pass. | Lima Locomotive Works |
| Mar. 28 | Boston & Maine | 3 | Diesel-elec. sw. | Electro-Motive Corporation |
| Apr. 11 | D. M. & Iron Range | 10 | 2-8-8-4 freight | Baldwin Locomotive Works |
| | Southern | 1 | Diesel-elec. pass. | American Locomotive Company |
| | | 1 | Diesel-elec. Pass. | Electro-Motive Corporation |
| | Alabama, Tennessee & Northern | 1 | Diesel-elec. sw. | General Electric Company |
| Apr. 18 | Laurinburg & Southern | 1 | Diesel-elec. sw. | General Electric Company |
| | Bessemer & Lake Erie | 5 | 2-10-4 freight | Baldwin Locomotive Works |
| | | 2 | 0-8-0 sw. | Baldwin Locomotive Works |
| Apr. 25 | Patapsco & Back Rivers | 4 | Diesel-elec. sw. | Baldwin Locomotive Works |
| | Philadelphia, Bethlehem & New England | 4 | Diesel-elec. sw. | Electro-Motive Corporation |

*This list does not include one order for twenty 4-8-4 type steam locomotives erroneously reported to have been placed by the Santa Fe with the Baldwin Locomotive Works.

motive is 421,000 lb. and the light weight of the tender 158,000 lb., or a total of 579,000. This locomotive with conventional piston valves was shown by a dynamometer car test to develop a maximum of 3,990 drawbar horsepower. A conservative estimate of the increase in power output after conversion to poppet valves indicates a probable maximum drawbar horsepower to 4,950. In order to develop this horsepower it would be necessary to increase the size and weight of the piston-valve locomotive by 139,000 lb. The weight change by the application of the poppet valves is an increase of less than 8,000 lb., which makes an estimated net saving in critical materials of 131,000 lb. per locomotive and tender.

The locomotive freezing order, which has been somewhat relaxed by the WPB, was made because of the shortage of steel plates for war production. Locomotive specialties, however, which reduce maintenance costs, which tend to give greater reliability of operation and which increase motive-power capacity with a minimum use of steel and other critical materials, also must be allowed to play the important role of which they are capable in the American war effort.

One of the New Electro-Motive 5,400-Hp. Freight Diesels in Service on the Santa Fe

# Maintenance A Key to Progress in Freight Service

## Upon the repair shops rests the burden of maintaining an adequate supply of serviceable equipment—Material shortages handicap operations

OVER a period of years the railroads, in the minds of many, have become of less and less importance as a transportation factor because of the development of other means of handling the movements of materials. Now, all of a sudden, as a result of a state of war in which our supplies of rubber are curtailed and the immediate necessity of the conversion of major industries to war production the railroads return to the spotlight not only as the nation's major transport facility but as a factor in the war program of such importance that without adequate freight transport service the war production industries cannot function efficiently nor can the materials of war be started on their way to the points of ultimate use.

Regardless of the efficiency of railway operation in the handling of motive power and rolling stock out on the road there is one thing that is absolutely certain and that is that if the supply of cars and the motive power to move them is at any time less than the demand on the part of shippers the entire war effort is slowed down. An adequate supply of equipment can be assured only by a proper balance between equipment maintenance operations and train operation on one hand and the installation of sufficient new equipment to offset the loss occasioned by the necessity of retiring equipment that is no longer fit for service.

Equipment maintenance operations naturally bear a very definite relation to the use that is made of equipment and, in the final analysis, the problem of the car and locomotive repair shop is one of restoring car- and locomotive-miles that have been run out in service. From a mechanical department standpoint there is also the added factor of making sure that there is in reserve enough serviceable equipment to take care of sudden demands.

### Shops Operating at Capacity

The locomotive repair shops of the Class I roads have been operating at a steady rate, somewhere near capacity, since the latter part of 1940. Some indication of the status of the motive power situation at that time can be gained from a study of the statistics for the peak traffic month of October, 1940. The total number of freight locomotives then was 22,218 and during that month 70.3 per cent, or 15,620 units were called into active service. The total number of locomotive miles was just under 50 million and the average number of miles made by each active locomotive was 3,200. With these figures fixed in mind it is again worth while to point out that the repair shops operated at a rather steady rate from that time on with the operations during the months from July, 1941, to February, 1942, slightly above the average for the year 1941 and the peak month of shop operations, judged on the basis of hours worked, showing but 10 per cent more than the average for the year.

Ordinarily shop operations should be such as to effect

**Modern Shop Facilities Plus Trained Men Assure Serviceable Equipment**

a restoration of run-out mileage as well as an adequate reserve provision. During the year 1941 freight traffic showed a gradual month-by-month increase resulting in an overall increase of about 10 per cent and an October peak traffic averaging 916,000 cars a week. Ordinarily the motive power maintenance programs should be such as to put the inventory of locomotives in shape to provide an adequate supply of power for the fall peak with a margin of reserve and then, after the peak month a gradual decrease in the percentage of active locomotives as a result either of shopping programs or of storing power.

With this thought in mind the figures in Table I present a rather interesting situation. In spite of the high rate of shop operations for almost the entire year prior to October, 1941, the peak traffic of that month cut into the reserve power to such an extent that the combined total of unserviceable and stored locomotives was at the lowest point of a 20-year period and the freight operation required the use of the highest percentage—79.9—of the total freight locomotive assignment. More than that, in order to meet the demand, the freight locomotives had to make an average mileage of 3,522—another 20-year record broken.

It would be reasonable to expect that after the October peak the percentage of active locomotives would drop as a result of shopping and storing but in November, 1941, the percentage was still 78.8 and in December 75.5. Then in January and February the percentage of active locomotives rose to 80.9—a new high record. Is it possible that these figures throw light on a situation last Fall wherein the roads were down to such a narrow margin that even with the reduced traffic which followed they find it necessary to keep almost 81 per cent of the power in service in order to assure proper attention being given to the locomotives? The 916 stored locomotives available in February of this year are probably of small comfort when their type, age and condition are taken into consideration.

**Table I—Freight Train Operation**

| | Total freight locos. 1 | Unserviceable 2 | Stored serviceable 3 | Active 4 | Active locos. per cent total locos. 5 | Loco. miles (000) 6 | Gross ton-miles (000,000) 7 | Freight train-miles (000) 8 | Freight car-miles (000,000) 9 |
|---|---|---|---|---|---|---|---|---|---|
| October, 1929 | 28,912 | 4,477 | 2,680 | 21,755 | 75.3 | 64,756 | 110,444 | 56,748 | 2,785 |
| October, 1940 | 22,218 | 5,246 | 1,352 | 15,620 | 70.3 | 49,984 | 92,945 | 44,272 | 2,249 |
| October, 1941 | 21,830 | 3,528 | 841 | 17,461 | 79.9 | 61,501 | 116,340 | 53,866 | 2,706 |
| November, 1941 | 21,828 | 3,637 | 997 | 17,194 | 78.8 | 56,893 | 106,241 | 49,924 | 2,505 |
| December, 1941 | 21,778 | 4,273 | 1,058 | 16,447 | 75.5 | 57,323 | 102,957 | 50,231 | 2,423 |
| January, 1942 | 21,888 | 3,253 | 926 | 17,709 | 80.9 | 59,460 | 106,532 | 51,929 | 2,483 |
| February, 1942 | 21,841 | 3,238 | 916 | 17,687 | 80.9 | 55,030 | 100,489 | 48,030 | 2,341 |

NOTE: Data Cols. 1 to 4 inclusive from Motive Power and Car Equipment of Class I Steam Railways, Statement No. M-240 OS-F; Data Col. 5, calculated; Data Cols. 6 to 9 inclusive from Freight Train Performance of Class I Steam Railways, Statement No. M-211 OS-A. Both statements from I. C. C. Bureau of Statistics.

## How Can Reserve Be Built Up?

We seem now to have reached a situation where operating the shops at capacity will hardly do more than restore the locomotive mileage rapidly enough to supply a motive power demand at existing rates with little or no allowance for reserve. The reserve needed to care for increases in traffic that are inevitable can be provided by (1) the installation of new power; (2) heretofore unheard-of increases in the number of miles run by each locomotive each month, made possible by (3) marked reductions in the length of time that locomotives are out of service for inspection, servicing and repairs.

In view of the definite restrictions that have been placed on the building of new equipment and without regard to any modifications that may be made tending to ease the new equipment situation the evidence points more and more to the fact that the repair shops are now holding and will continue to hold in an increasing measure the key to the ability of the roads to meet a traffic demand beyond that which was anticipated a few months ago.

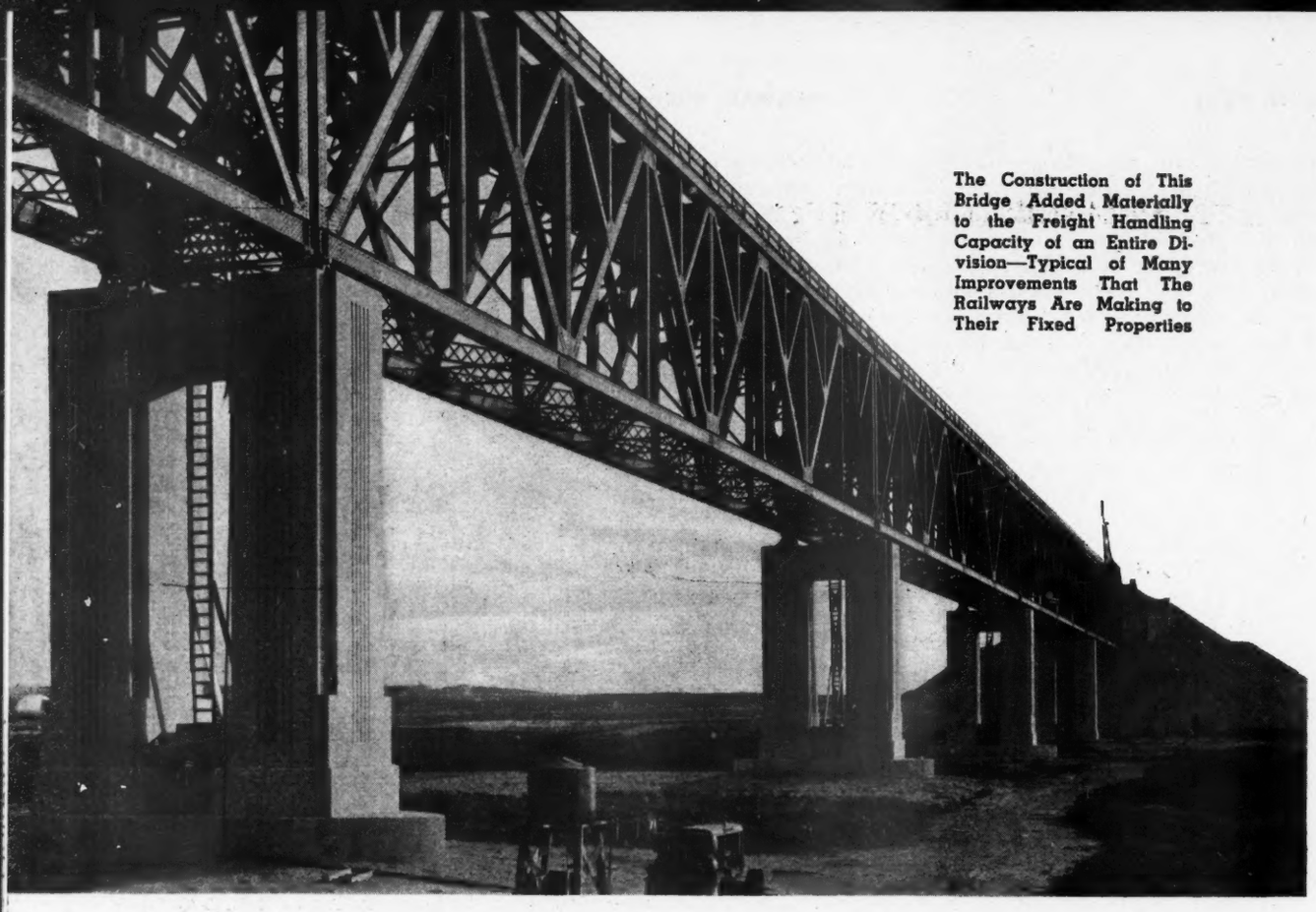
Increases in the average monthly mileage per locomotive naturally result in an accelerated rate of shop operations, particularly as an increasing number of the older locomotives are pressed into service, for it is not possible to get as much service from this older power between shoppings for general repairs.

The ability to effect decreases in the time that locomotives are out of service for inspection, servicing and repairs depends almost entirely on two things: supervision and facilities. This is especially true in connection with running repairs for it has been found possible to reduce the time required to get locomotives into the enginehouse after arrival at terminals by as much as 20 to 50 per cent. With so much depending on maintenance of equipment facilities and organizations every possible effort must be made to analyze conditions with a view to effecting desirable changes and improvements without delay.

Beyond this point the ability to maintain equipment as fast as it is needed for service rests almost entirely upon manpower and materials. Any move made or contemplated which tends to reduce the supply of either must ultimately be reflected in a reduction of rail transportation service. At this moment shops are curtailing operations because of shortages of materials and unless some action is taken to supply needed materials this situation will be further aggravated.

Another factor of importance in the shop situation is the proposal to use the so-called "excess capacity" or "surplus facilities" for war production work. In view of the extent to which private locomotive and car building capacity has already been diverted to war production whatever excess capacity there may be in railroad shops could be used to greater advantage in building up a protective reserve of equipment to insure the movement of wartime supplies in whatever volume the future may call for.

It is worth repeating again that transportation is a service without which the entire war effort—production and supply—can be nullified in proportion to the failure of that service. Exacting as the war and lend-lease program is in its demands for manpower, materials and manufacturing facilities the temptation to "convert" transportation facilities into direct war production facilities should be resisted. Railway repair shops, their manpower and the materials to keep them busy can play their most effective role in the nation's war effort in the service for which they were intended—to maintain the essential supply of locomotives and cars.



**The Construction of This Bridge Added Materially to the Freight Handling Capacity of an Entire Division—Typical of Many Improvements That The Railways Are Making to Their Fixed Properties**

# Engineering in Transportation

IN the "all-out" war in which the United States is now engaged, officers and employees in the engineering and maintenance of way departments of the American railways consider themselves in uniform and at war, and, as in no previous conflict, even as the railways as a whole, are ready to make an "all-out" effort to back up their country. With so large a stake in the outcome of the war, and so large and important a part to play in its successful consummation, many of these men are deeply concerned lest any developments beyond their control may hamper their efforts to maintain the fixed properties of the railways in condition adequate to the tasks ahead and, unwittingly thereby, hamper the efforts of the country to win the war, and in the shortest possible period of time.

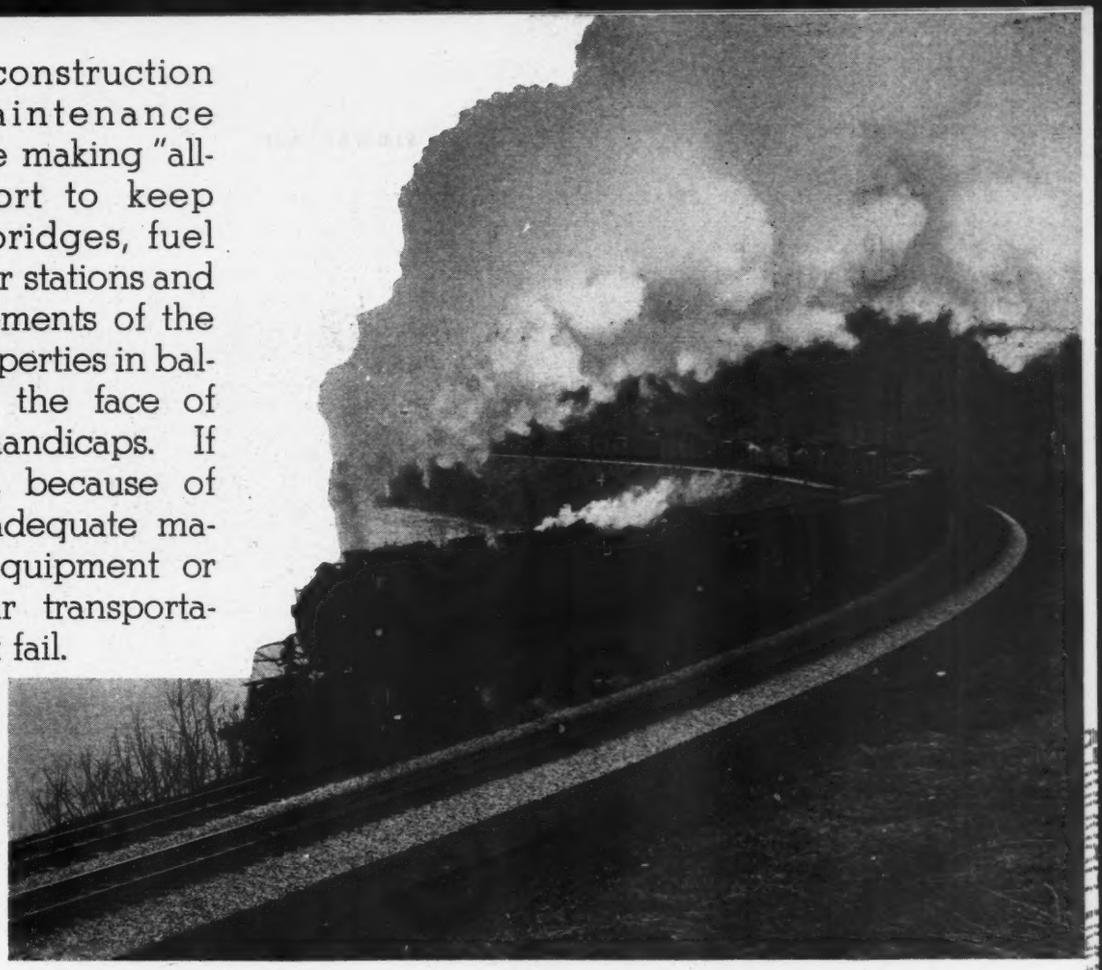
Engineering and maintenance men are concerned in this regard, first, because they fear that there are those in authority over their activities, burdened with vast and unsolved problems relating to the war as a whole, who, in the light of enviable performance in the past, are inclined to take for granted the adequacy of the fixed properties of the railways, including roadway, tracks, bridges, yards, terminals, etc., while they, themselves, as the best qualified men in the country to know, realize fully that there can be no successful "all-out" rail transportation to back up our national war effort that is not based upon a sound track structure and adequate supporting facilities—and furthermore, that such a track structure and supporting facilities do not just happen, irrespective of adequate attention, equipment and materials. Engineering and maintenance men are concerned also because, like few other men in the country on or outside the railways, they know first-hand the present needs of the fixed properties following the most prolonged and devastating economic depression in the history of the country; know from experience how these needs are magnified under the wear and abuse of increased traffic and higher speeds; and realize that as the result of the demands of other phases of the country's war effort, they may be unable to secure the materials, equipment and manpower essential to their successful efforts.

Engineering and maintenance men ask no favors, no special consideration, no unwarranted priorities in equipment or materials, but with a full understanding that there can be no prolonged successful war transportation in the country, if, indeed, successful war effort as a whole, unless the rail transportation machine—locomotives, cars, tracks and structures are kept in balance, they seek only those things that will insure that balance, to the ultimate end of serving their country's needs best and winning the war.

### Increased Expenditures of Recent Years a Help

Fortunately for the railways and the country, it is not as though the railways entered the present period of stress totally unprepared, insofar as their fixed properties were concerned. In fact, it is one of the fortunate circumstances of our war effort that, of their own volition, seeking to rehabilitate their properties from the depths of the depression, and to be in the best possible position to serve the needs of the country as it pulled out of the depression, the railways have in recent years spent increasingly large sums on their fixed properties,

Roads' construction and maintenance forces are making "all-out" effort to keep tracks, bridges, fuel and water stations and other elements of the fixed properties in balance in the face of serious handicaps. If they fail, because of lack of adequate materials, equipment or men, war transportation must fail.



**A Sturdy Track Structure, From Rail to Roadbed, Will Help Carry the Country to Victory—Without It, War Transportation and Our War Effort May Bog Down**

# as Essential as Engineering in War

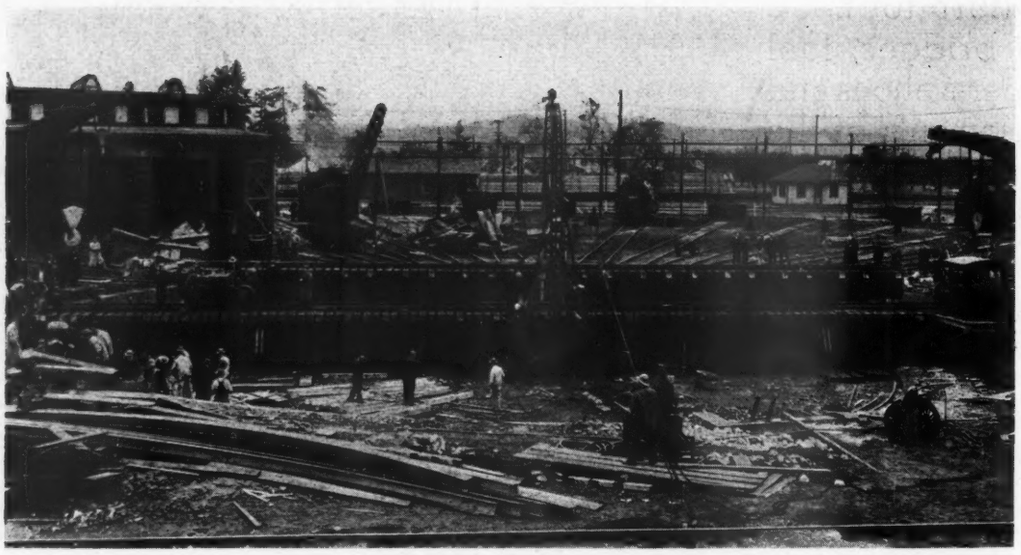
carrying out a long-established policy of continuing improvement just as fast as traffic and earnings will permit. Thus, it is of interest to note that whereas the expenditures of the railways for additions and betterments to their fixed properties had reached a low of approximately $88,500,000 in 1933, they were $186,916,000 in 1937, $157,241,000 in 1940 and, according to preliminary figures released by the Association of American Railroads, reached a total of $175,453,000 in 1941.

### Stronger, Safer Rail

Likewise, for maintenance of way and structures, expenditures which had dropped to a low of $322,000,000 in 1933, were, with increased traffic and earnings, increased to approximately $496,000,000 in 1937, to $497,000,000 in 1940, and jumped to more than $603,000,000 in 1941, the 1941 figure representing the largest expenditures for similar purposes in any year since 1930, and the expenditures for 1942 are currently exceeding those for 1941 by about one-third. While a breakdown of the 1941 figures, showing the amounts spent for the different classes of maintenance of way and structures work, are not yet available, it is known that increases were made all along the line—for roadway maintenance, for rails, for ties, for track laying and surfacing, for bridges and culverts, for buildings, for water supply, etc.—in every case representing the largest expenditures for these specific classes of track and structures maintenance since before the depression.

And so the record goes, a record of constant progress from the depths of the economic depression to a maximum effort being made at the present time. And the fact that this has been manifest not alone in the quantity of the work done, but in improved quality as well, is seen all along the line. For example, while outwardly much the same in appearance as 10 years ago, rail, through improved design, larger section, improved chemical composition, improved mill practice and improved methods of laying and servicing in track, is a substantially different product today. That the railways generally have been adopting heavier better-designed rail sections is seen in the fact that whereas as recently as 1933, only about 75 per cent of the railroad rails rolled in this country were of sections weighing 100 lb. per yd. or heavier, as much as 90 per cent of the rails rolled in more recent years has weighed 100 lb. per yd. or heavier, and as much as 39 per cent has been of sections weighing 120 lb. per yd. or more.

Of equal importance with the increased weight and improved section of rail adopted by the railways have been the outstanding developments of recent years in the manufacture of rails, including the controlled-cooling and Brunorizing processes and rail-end hardening, processes developed through the combined efforts of the railways and the manufacturers in the interest of eliminating transverse fissures in rails and preventing the premature destruction of the rail ends through batter under the action of passing wheels. As the result of these efforts to improve the quality of rails, the trans-



**Many Roads Have Increased the Length of Turntables to Handle Bigger Power—This Job Was Done on the Southern Pacific**

verse fissure, the nightmare of all track maintenance men, and the cause of many serious railway accidents, all vigilance to the contrary, is believed to have been eliminated from all new rails, leaving the problem of controlling and ferreting out fissures that are still a serious threat in rail rolled prior to the widespread adoption of the controlled-cooling and Brunorizing processes, together with such new forms of failure as service may develop.

That the railways have been determined to control this latter phase of the transverse fissure problem is seen in the further development and increasing use of transverse fissure detector cars to ferret out all rails which have developed fissures or any other hidden defects that might impair the safety of the track structure. Today, these cars, more sensitive and selective than ever before, and able to disclose internal defects even beneath superficial surface defects, are being operated over the important tracks of most roads two or more times each year.

With these constant improvements that have been made in rails to increase their service life and integrity, as well as to improve the riding quality of the track, have come stronger track fastenings of improved designs; better grades of ballast and a deeper ballast section; and larger treated cross-ties of improved quality, with closer adherence to approved grading standards—all important in the effective and economical maintenance of the track structure, and vital to track that must carry the increased loads and speeds of war-time traffic. So, likewise, has come increased attention to roadway drainage, not alone in the matter of improved culverts of larger capacity to carry water unrestricted beneath the tracks, but, of equal importance, through channel changes, right-of-way sloping, deep ditching and subdrainage, to direct surface and subsurface water away from the roadbed and to collect and drain off such water as cannot be deflected. With the growing recognition that water is one of the worst enemies of the track structure, increasing routine track maintenance and costs, and the cause of thousands of slow orders that impede the speed of trains, road after road has given increased attention to these various methods of drying out their roadbeds, for example, the extensive deep ditching that has been carried out on the main line of the Pennsylvania between New York and Philadelphia, Pa., and the widespread right-of-way sloping and general roadbed rehabilitation that has been carried out over several hundred miles on the Great Northern.

### Extensive Efforts to Protect Roadbed

At the same time, and in spite of their inadequate earning in recent years, the railroads have carried out extensive programs of cut widening and embankment strengthening to dry out and increase the stability of their tracks, and have spent millions for roadway protection against the ravages of high water and floods, blockades caused by drifting snow, and slides or avalanches of material brought down in hillside streams and washes. As brought out so effectively in a report presented before the last annual convention of the Roadmasters' and Maintenance of Way Association, the railways have employed almost every conceivable means of protection against stream erosion, both on and far from their rights-of-way, realizing that theirs is not "fair-weather" transportation, but rather an instrument for uninterrupted service to the public and industry—and now, vital to our war effort.

These forms of protection have included extensive channel changes to remove the threat of floods; the extensive use of rip-rap, concrete paving and various types of jetties, dikes and revetments; and, in many instances, the construction of dams and other forms of flood control far up lateral streams, primarily to hold back the deluge of earth and rock that would otherwise foul the railroad with every sizable storm. Added to these measures, the railways, particularly in the mountainous regions of the Pacific Coast area, have spent many millions of dollars in recent years for line changes to get away from eroding parallel river courses or side-hill washes and debris cones that have periodically engulfed their tracks in the past. And, at the same time, in more or less routine operations, the railways continue to enlarge hundreds of waterway openings beneath their tracks each year as conditions indicate the need, many of these projects involving major bridge reconstruction work.

Realizing the super-human, if not economically impossible, task of protecting every foot of right-of-way against the threats of nature as they traverse rugged mountain territory, skirt high bluffs and span the swiftest of streams, the railways have installed many miles of warning devices at hundreds of locations in the form

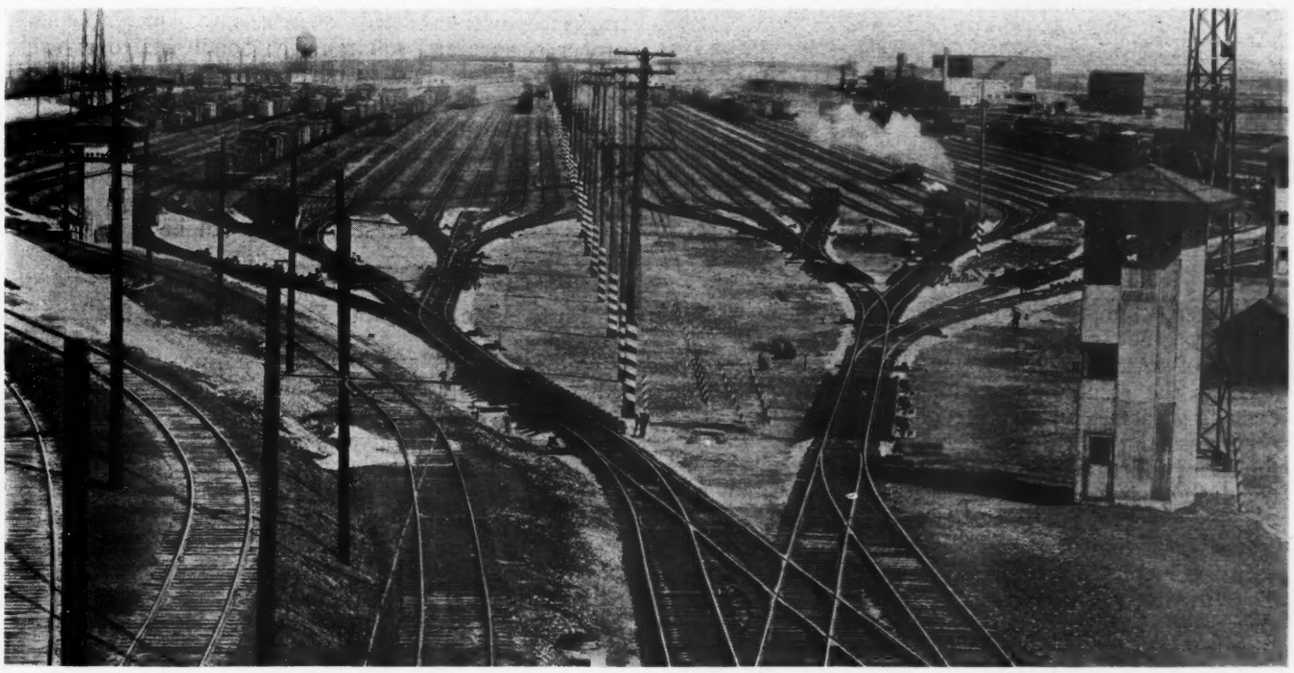
of slide detector fences, high-water alarms and bridge burnout warnings, all interlocked with the roadway signal system in such manner as to warn enginemen of possible unsafe conditions ahead, and thus, both day and night, prevent danger to train operation. Supplementing these precautions, the railways, through trackwalkers, cut and bridge watchmen and motorcar patrols, keep an almost constant check on every element of the fixed property.

Added to all of these factors that have made rail transportation the safest and most dependable form of transportation in the country, the railways, in an effort during recent years that is now having a profound effect upon the present movement of war traffic, have been building "speed" into their tracks. This has been done not alone through heavier rail, better ties, deeper ballast and a higher standard of track construction generally, as mentioned previously, but also through curve reductions and general track refinements which only a few years ago would have been considered totally unwarranted. Today, as the result of extensive programs undertaken in harmony with improved train schedules and, as earnings would permit, road after road has ironed out the curves over hundreds of miles of territory, in many cases reducing the curvature to a maximum of one degree, which, with long approach and runoff spirals, proper super-elevation and adequate attention to gage, permits speeds up to 100 m. p. h. In fact, one of the striking evidences of the progress in train transportation in recent years is the prevalence of speed restriction boards on many roads, reading "85" and "90," indicating "slow down to 85, or 90 m. p. h."—and often where 50 or 60 m. p. h. was considered phenomenal speed as recently as 10 years ago.

It is true that, almost invariably, the inauguration of streamlined passenger service, whether steam or Diesel operated, has opened the way, and has set new standards of speed and shortened the schedules of passenger service generally on the railways, but the fact remains that once the way has been opened on a road, freight service has inevitably followed the trend, with results no less striking than in passenger service. Today, as a result, freight trains handling the commerce and war production of the country are traveling at former passenger train speeds, expediting deliveries to nearly every point in the country, and, through the more intensive use of cars and locomotives thus brought about, are influencing favorably the car and locomotive situation just as definitely as keeping locomotives out of the shop and the quick release of cars by shippers for reloading.

Along with the reduction of curvature to speed up main-line movements, the railways, as pointed out in another article in this issue, have spent many millions of dollars for various forms of signaling, including types beyond those dictated alone by considerations of safety; they have been increasing the use of longer turnouts at points of crossover, at the ends of double track, and at points of diverging routes, increasing the maximum allowable speed at these points, and especially where slower speeds would constitute a bottleneck in otherwise high-speed territory. Likewise, in the interest of expedited train movement, and on an increasing scale as earnings have permitted, the railways have been installing spring switches at the ends of double track and at passing siding turnouts, particularly where ascending grades are involved, where to stop and start trains to permit the manual throwing of switches would involve delays and the hazard of pulled drawbars, not to mention the increased consumption of fuel.

Not without its effect on the safety and security of freight train movements, too, is the growing acceptance of mechanical locks for main-line switches, to prevent their being opened accidentally under trains as the result of damage to the switch stands or other operating mechanisms, with the serious disruption of traffic, if not destruction of equipment, that might result. At least one road is installing such locks progressively on all main-line switches, while others, with more limited funds,



**Yards Must Be Made as "Fast" as the Main Line, Or Our Materials of War Cannot Be Kept Moving to the "Front" as Fast as They Must —The Recently Rebuilt Gravity Classification Yard of the Belt Railway of Chicago**

**Without Adequate Water of Proper Quality, the Railroads Would "Dry Up" as a Transportation Agency**

have been attempting to equip first those switches near highway grade crossings and at crossovers where the hazard of switch stands becoming knocked down or damaged as the result of something being thrown against them is greater than at other points.

As essential as the track structure itself in the continuity of railroad main and branch lines over the country, bridges have not been neglected at any time from the standpoint of safety, and have been given largely increased attention in recent years to keep them in step with the increased weight of power and speed of trains. To this latter end, thousands of bridges have been strengthened through major repairs and the provision of additional cover plates, connection angles and stiffeners, and the tightening of diagonal bracing and web members. In fact, road after road has overhauled its bridges in territory after territory, in some cases embracing entire lines, to raise the bridge ratings and adapt them to new classes of power assigned to meet increased traffic conditions. And this work, much of which is still to be done, and much of which must be done as our war effort is imposing main-line traffic and loads on lines little used in recent years, will go forward just as rapidly as the roads can secure the necessary materials and equipment to carry it out.

### Yards and Terminals Must Be Adequate

While few of those who are depending on the railways for super effort and performance in the handling of war materials and general freight appreciate the importance of yard and terminal facilities, not to mention the details of their layout and operation, the railways realize full well that yards and terminals are the "heart" of freight operations, and that congestion in any one of them can restrict seriously the flow of traffic over the outlying system, with interrupted schedules, delayed deliveries, and a general tying up of cars and locomotives longer than necessary. Thus, to as full an extent as their earnings in recent years have permitted, and consistent with keeping the entire railway plant on balance, the railways have been adjusting yard layouts, strengthening the tracks generally, and adding new facilities where necessary, giving increasing attention to all of these factors during the last year or more as national and international developments have indicated increasing demands ahead.

Basically, the modern classification yard calls for an adequate number of receiving and classification tracks of sufficient length to take care of the greatest demand, and, where a departure yard is found desirable, it is essential that it have sufficient tracks of adequate length to permit the proper and ready checking of trains for their next section of road run. But far and beyond these basic elements of the modern classification yard, such yards under intensive operation require modern methods of handling waybills; equipment for the rapid formulation and distribution of switching lists; rapid communication systems; humps of proper heights and grades; car retarders; multiple switching leads to the classification tracks; power-operated switches; adequate signals; proper surface and subdrainage; floodlights to expedite night operations; and, in northern climates, switch heaters, or snow melters, to keep switches operative under the most severe conditions of sleet or snow. In addition, to these facilities, several roads have installed and are finding highly effective amplified communication systems, whereby the yardmaster can call instructions to yard crews or others interested, which can be heard at any point in the yard.

### Must Have Adequate Fuel and Water Stations

Both in yards and out on the line, there are still other engineering and maintenance of way department responsibilities which the railways have not overlooked, and which must be given still greater attention in the future as required if the railways are to meet the increasing demands of war transportation. Important among these, the failure in any one of which can affect train operation seriously, are locomotive water and fueling facilities, both of which are playing a most important part in the more intensive and extended locomotive runs being made today between terminals or service points.

Without adequate and dependable water supplies of proper quality, there could be no modern rail transportation as we know it today. Every year the railways use in excess of 430 billion gallons of water for locomotive boiler purposes, and during 1942 their requirements will likely exceed 450 billion gallons. Much of this water is not unfit for boiler use in its natural state, but that much of it is totally unsuited without treatment of one kind or another is evidenced in both the vast amount of sludge and scale-forming solids removed from locomotive boiler water each year, and the deplorable records of engine failures that existed prior to the widespread adoption of water treatment. As a result of their efforts in improving the quality of their water supplies, the railways have more than doubled the availability of their power for road service, and have reduced road delays due to engine failures to only a small fraction of what they were prior to the adoption of adequate water treatment. In fact, through water treatment, some roads have practically eliminated engine failures, whereas such failures every 5,000 to 10,000 locomotive miles were not uncommon in earlier years.

Beyond this phase of their water problem, the railways have given increased attention to more dependable sup-

plies, especially in areas of poor natural supplies or subject to periodic droughts; have relocated and adjusted the capacities of hundreds of stations to adapt them to or to permit longer engine runs, fewer water stops and the use of larger tenders; and have installed modern automatically-operated pumping equipment in thousands of plants to reduce operating costs. In this latter regard, it is of interest to note that the Southern Railway now has more than 80 automatically-operated pumping plants over the system, and the Illinois Central more than 100 such plants, while a few smaller roads, including the Wabash, have nearly 100 per cent automatic operation of their water stations. At the same time, to reduce the delays to locomotives in taking water, many roads have increased the delivery rate of their more important water columns, such rates today ranging from 3,500 to 5,500 gal. per min., as compared with 1,500 to 2,000 gal. per min. only a few years ago, effecting savings of as much as 10 minutes per water stop.

And so with fueling stations, the railways have increased their capacity, have installed modern equipment, and, in not a few instances, have relocated plants entirely to permit the refueling of main-line trains without cutting off the locomotives or detouring trains from the main track. At the same time, a number of outstanding stations have been built during the last few years where locomotives can refuel, take on sand, replenish their water supply and drop ashes, all simultaneously and with one spotting. Such is the tempo of modern train servicing, and it is significant that only where this tempo of operation prevails are the best records in freight train operation being attained.

### Forces Reorganized and Equipped

Beyond all of these physical aspects of the fixed properties of the railways and their relation to the country's war effort, no less important to the success of this effort is the almost complete revolution that has taken place in construction and routine maintenance of way and structures operations and methods in the interest of higher standards of work, speed in carrying out operations, and minimum interference with train operation. Under this revolution, highly specialized gangs, fully equipped with power tools and units of work equipment, have assumed most of the larger and more arduous tasks. And the fact that power equipment has played an important part, and must continue to play an important part in the work to be done, is seen in the fact that from little more than a start in the use of modern equipment 15 or 20 years ago, the railways now have an investment in such equipment of well over $115,000,000, having expended more than $20,000,000 in the years 1937 to 1940 alone for approximately 13,500 units, and having added to this to the extent of at least another 8,000 units in 1941, at an additional cost of approximately $10,500,000.

To an increasing extent, the equipment purchased in recent years has been of the off-track type, including cranes, draglines, air compressors, electric generators, mowing machines, automobile trucks, tractors and a variety of grading and ditching equipment—all operating entirely independent of the track rails in the interest of minimum restrictions to work operations by traffic, and minimum interference to traffic by work operations.

Like the track forces, the bridge and building forces are making every provision in carrying out their work, to avoid delays to trains. On important lines today, bridge repairs and many complete renewal jobs are being done without slow orders of any kind. To this end, bridge and building forces are employing off-track equipment to a greater extent, are building more substantial falsework, and, where shoofly tracks are essential to carry traffic during the course of operations, they are being built to much higher standards than formerly, in many cases to standards that will permit normal or near-normal train speeds.

### Girded Against Raids and Sabotage

Beyond these many usual and ever-present construction and maintenance problems, and perhaps more outwardly linked to the war effort of the railways, the various roads of the country, and especially those along the Atlantic and Pacific seaboards, have taken many air-raid precautions and other measures to guard against acts of sabotage in recent months. Acting for the railways as a whole, a special committee of the Association of American Railroads was organized several months ago for the purpose of developing recommended practices regarding blackout methods and devices, and is about ready to make report. In the meantime, most of the railways in the East and along the West coast, acting in conjunction with local defense agencies, the Office of Civilian Defense and the War Department, have taken at least some individual action towards blacking out their property when required, and in perfecting air-raid precautions generally.

On the Pacific coast, for example, the Southern Pacific has already devised and installed complete means for blacking out, shading or hooding its building lights, switch and signal lights, and exterior and interior train lights so that, regardless of blackouts in any area, it can carry on in its shops, stations and terminals, and keep its trains rolling over the line. Some roads along the East coast have gone nearly as far, and even roads located in the Central West have perfected blackout organizations and have co-operated with civilian defense authorities in tests designed to blot out railway facilities from the air if conditions should require.

**The "Mess Hall" of the Locomotive Must Be Properly Located and Give Fast Service**

Beyond these efforts, the perfection of which awaits

only the final recommendations of the Association of American Railroads, the railways generally have not overlooked the possibility of efforts to cripple their properties through sabotage, and, with this in mind, are now patrolling and guarding important bridges and tunnels throughout the country both day and night. In addition, many roads have undertaken campaigns to educate their employees to be on the alert for possible saboteurs, and, in a number of cases, railroad employees have been deputized in order to be able to cope more effectively with suspicious persons.

Of equal importance with the various measures already referred to, a number of roads are adopting measures to expedite the repair of bomb damage if it should occur. On some roads, these plans have included the accumulation of emergency stocks of timber-trestle and filling materials. These materials are being stored at strategic points, not only to have them near those points most seriously threatened, but in an effort to de-centralize storage depots so that, in the event of attacks, the danger of losing all of their emergency materials will be minimized. Everywhere, and although the railways as a whole are far from fully prepared to meet every emergency which may grow out of our war effort, their activities demonstrate that they have a keen appreciation of the problems presented and of their responsibilities, and that they will live up to them.

### Are Reaching the Limit of "Belt Tightening"

In the light of the foregoing, it cannot be said that construction and maintenance men have failed to keep pace, but it is a fact, known full well to every one of them, that the fact that they have not failed is due primarily to a severe "tightening of their belts" all along the line—in materials, in equipment and in physical effort, a tightening that has been under way since the onset of the depression, and one that is bound to have its physical limitations. Large as have been the expenditures for construction and maintenance during the last few years, as compared with those in the years in the depths of the depression, it must not be overlooked that these expenditures have been relatively small as compared with those in the years 1925 to 1929, years when railway traffic was less than it is at present, and materially less than the traffic in sight for the year ahead. For example, the figures show that whereas the annual gross expenditures of the Class I railways of the country for additions and betterments of their fixed properties (not net additions) averaged $478,174,000 in the years 1925 to 1929, inclusive, annual expenditures for the same purposes in the ten years, 1932 to 1941, inclusive, averaged only $134,866,000, or appreciably less than one-third as much.

As indicated by these figures, the railways, during the last decade, have, of necessity, held in abeyance hundreds of projects that they would have undertaken normally in the interest of improved service and greater efficiency and economy. They also indicate clearly that, averaging approximately $343,000,000 less per year during the last ten years than in earlier period referred to, the railways, without increased expenditures for capital improvements, especially in the face of the large demands now being made upon them by the country's war effort, cannot long continue to carry their present load successfully, not to mention the increased load that is certain to be thrust upon them in the days and months immediately ahead.

And as in the case of additions and betterments to their fixed properties, so it has been with the maintenance of these properties. While the increased expenditures for these purposes during recent years have had an important influence in raising the standards of maintenance of the tracks and structures generally, the true picture of the condition of the different elements of the fixed properties of the railways can be seen only by a comparison of the expenditures that have been made for their maintenance during the last 11 years with those for the years immediately preceding the depression. During the five years ending with 1929, these expenditures by the Class I railways of the United States (including switching and terminal companies) averaged $849,020,923 annually, whereas, in the 11 years from 1931 to 1941, inclusive, the annual expenditures of these same roads for the same purposes averaged only approximately $444,000,000, or little more than half as much.

### Rail Need Causes Special Concern

In the light of these facts, it is little wonder that maintenance of way and structures men are concerned about the future, and especially as one by one they are threatened with or already face critical shortages in materials, equipment and labor. Rail is a matter of special concern. Following seriously restricted renewals throughout the depression period, amounting to an average of only 714,014 tons annually in the years 1931 to 1939, inclusive, as compared with 2,064,710 tons annually in the years 1925 to 1930, inclusive, maintenance officers had begun, in the larger renewal programs of the last two years, amounting to 998,914 tons in 1940, and approximately 1,200,000 tons in 1941, to see some hope that the deferred rails renewals of the depression period could be overcome by progressively larger programs in the immediate future. In fact, in the face of rapidly increasing traffic and the requirements for peak transportation contemplated in 1942, the railways, at the request of the Office of Defense Transportation, prepared estimates of their 1942 requirements for rail, which, after revision at the request of the ODT, called for 1,632,394 tons for the year, and for the delivery of 657,110 tons during the first quarter of the year.

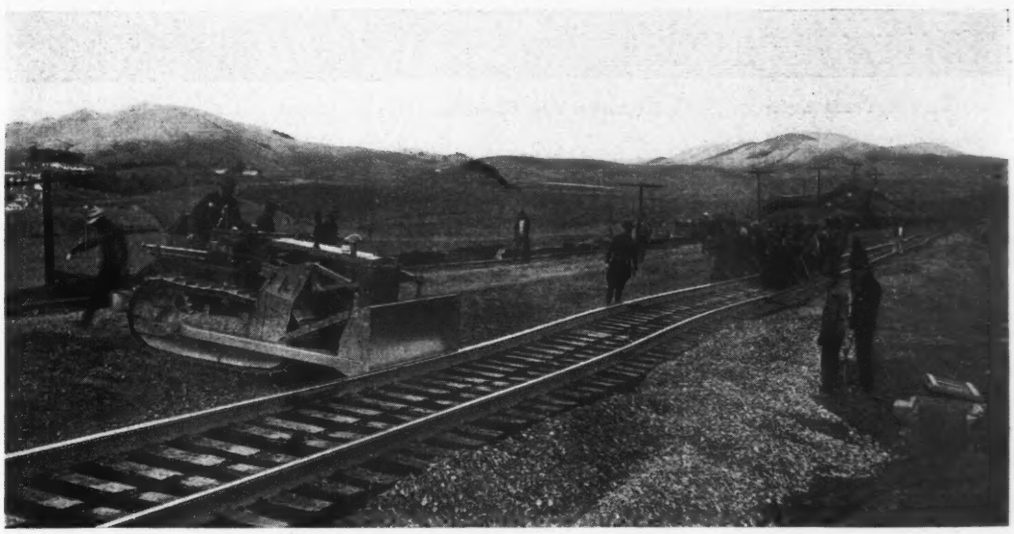
On February 1, first-quarter allotments of steel for maintenance of way and structures work were announced by the War Production Board, including 538,000 tons for new rails, "provided the requirements can be met without interfering with shell production"—a downward adjustment of 119,110 tons. Subsequently, these figures were cut still further to 350,000 tons for delivery during the first quarter, a further revision downward of 188,000 tons, or a total of 307,110 tons less than requirements estimated by the railways. Making the matter still more serious, the railways are now having difficulty in securing even this seriously restricted amount of rail, and, in addition, are being called upon to surrender large quantities of relay rail, normally reused on branch lines, in passing tracks, yards and other secondary tracks, for use by the army and navy in cantonment and ordnance plant construction.

While not questioning the importance of the situation that is restricting the deliveries of new rail to them, maintenance men, in the face of the foregoing facts, are showing serious concern, and this concern is being heightened in the light of recent accidents attributed directly to rail conditions, indicating that a considerable amount of the rail in track is reaching its fatigue limit, if not its ultimate life as measured by wear and batter.

Despite the large expenditures for maintenance of way work equipment in recent years, the fact that the railways have far from adequate equipment to carry on

essential programs in the days ahead is evidenced by information secured from them late in 1941, indicating that they will need approximately 6,400 additional units of equipment of all types in 1942, at an estimated cost of $8,600,000, these figures not including portable, power-operated hand tools used principally in bridge and building work. That the railways will be able to secure anywhere near this amount of needed equipment under existing priorities is now seriously questioned. The recent order of the War Production Board freezing all crawler-mounted work equipment is also a serious blow to the maintenance forces, making unavailable to them the very type of equipment upon which they had begun to lean most heavily in their effort to get the maximum amount of work done without interfering with train operation.

All of this assumes more serious proportions in the light of the recent report by Otto S. Beyer, director of the Division of Transportation Personnel of the ODT, that the railways face an acute shortage of labor, the report estimating that the railways as a whole will need approximately 320,000 new men during the remainder of the present year to fill new jobs, to replace men taken into the armed services, and to fill vacancies created by deflections from their ranks into war production and allied industries.



**If the War Effort Continues to Require More Tracks for More Camps, More War Industries and Heavier Main Line Traffic, They Can Be Built Only With More Men, Machines and Materials**

### Many "Helpful" Suggestions Fall Short

In apparent good faith, many suggestions have been made by persons not directly connected with the railway industry as to how corners can be cut and critical materials saved. Unfortunately, based upon lack of full knowledge of railroad problems, most of these suggestions are wholly impractical. Thus, on the assumption that high speed increases materially the abuse of the track structure—which assumption is entirely correct—there have been suggestions that train speeds be reduced materially, these suggestions overlooking entirely, apparently, the facts pointed out earlier in this article that to reduce freight train speed would add serious complications to the car and locomotive situation, and at a time when this situation is being viewed with the most serious concern by the ODT and the railways themselves.

In addition, in the interest of saving steel, suggestions have been made that would curtail the construction of such facilities as coaling stations and water facilities, and calling for the joint use of existing facilities by different roads to avoid new construction. There are, of course, cases where the joint use of such facilities could be made effective, and investigation should be made to this end. However, in the light of steps already taken by many roads to relocate and adjust such facilities to avoid even the slightest re-routing of important trains in order to speed up movements, and, not without significance, the stress laid on the importance of this effort in a report on Getting Greater Use From Locomotives, presented before the annual meeting of the American Association of Railroad Superintendents in Chicago, on May 13, it is evident that any general attempt at the joint use of fuel and water facilities at terminals or other points to avoid new construction, could result only in less effective locomotive utilization and unnecessary delays in the handling of traffic. Likewise, in the light of the importance of adequate and suitable locomotive boiler water in reducing engine failures and shopping time, it is evident that any curtailment in the construction or betterment of essential water service facilities cannot have other than a serious effect upon the railroad locomotive situation, now viewed with such concern.

Engineering and maintenance men on the railways have not shirked under difficulties and serious handicaps in the past, and, come what may, they will not shirk as the railways and the country face the war-time problems of the future. However, it would be a serious injustice to these men and to their respective roads, and, likewise, to their country in its needs for adequate and dependable war transportation, not to point out the foregoing facts relative to the situation as regards the fixed properties of the railways.

The engineering and maintenance forces of the railways have accepted the challenge of the hour—they are committed to so conduct their operations as to interfere with traffic to the least possible extent; they are committed to make the minimum use of revenue cars in company work, and to release promptly all such cars as must be used; they are committed to make the most of what they already have in materials and equipment; they have accepted the responsibility for training new forces as fast as possible to offset deflections from their ranks; and they are determined to afford maximum protection to the railways against accidents, war damage and acts of sabotage. Given at least the minimum essential help they require in equipment, materials and men, they will not fail—without it, anything can happen.

**Classification Yards Equipped With Retarders Are Operated Day and Night**

# Modern Signaling Keeps Freight Moving

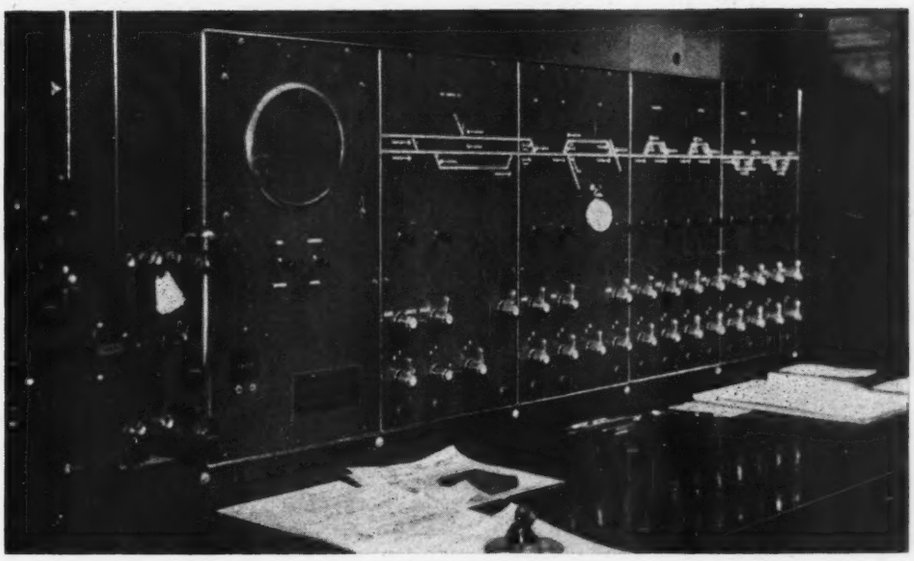
## Delivery of cars is expedited by automatic block signals and centralized traffic control on the line, and by power switches, car retarders, flood-lighting and communication systems in classification yards

HAVING loaded a car, a shipper is interested in having that car delivered to the consignee promptly. Modern signaling facilities, in various forms, aid in keeping freight cars moving at the speeds for which the locomotives are designed, rather than losing time unnecessarily on passing tracks and in yards. By thus reducing the time of a car enroute between shipper and consignee, the cars can be utilized more intensively, and the locomotives can handle more trains. Automatic signaling, interlockings and centralized traffic control save train time on the line, while power switches and car retarders reduce delays to cars in classification yards. Installations of this character, which have been placed in service on numerous railroads during the last few years, are aiding materially in the efficient handling of the heavy traffic occasioned by the war program.

The elimination of collisions between trains is paramount, not only as a means for preventing injury to persons, but also to eliminate damage to equipment and lading, as well as to obviate delays to other trains while the line may be blocked.

To prevent such accidents, which may be caused by mistakes in the use of time tables and train orders, the railroads of the United States alone have equipped nearly 100,000 miles of lines (97,489 to be exact) with automatic block signaling which is controlled by the trains as they occupy track circuits. They installed this protection on 1,030 track miles during 1941. Furthermore, the railroads have modernized the signaling in service on extended mileages by lengthening the blocks to accord with the increasing speeds of modern trains. Programs of this nature have been in progress on many roads during the past year, including the Union Pacific, the Norfolk & Western, the Pere Marquette, the Missouri Pacific, and the Southern. On some roads, additional signal aspects have also been provided as a means for increasing safety and minimizing the spacing between following trains.

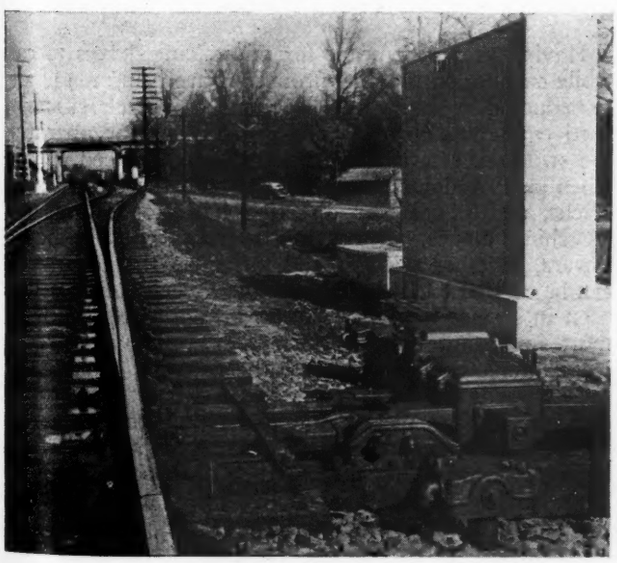
Under certain operating practices, which have grown out of the possibility of mistakes in the use of time tables and train orders, orders to establish meets between trains must be issued as much as an hour or more ahead of the time for making the meets. In the meantime, some of these trains may lose time, and delay the entire operation. To correct this condition, the railroads are installing increased mileages of centralized traffic control,



**The Indication Lamps on a C. T. C. Control Machine Show the Locations of the Trains on the Territory so that the Operator Can Arrange Close Meets and Passes**

by means of which train movements are authorized by the indications of signals which are controlled from a machine located at a point central to an extended mileage. By glancing at an illuminated diagram on such a machine, the operator knows the location and progress being made by the various trains on the territory and can, therefore, so control the signals as to direct trains to make meets and passes on close timing, thereby keeping all trains moving wherever idle sections of track are available.

Another source of delay to trains is the time lost when stopping them for the operation of hand-throw switches when entering or leaving passing tracks. Even if a meet between two trains is made to close schedule, the train which takes siding loses from 15 to 30 minutes, depending on its length and weight. In order to reduce these delays, many of the centralized traffic control projects now include power switch machines under the control of the C. T. C. operator. With such methods of operating switches, the trains move into and out of passing tracks at speeds as high as 25 to 30 m. p. h. By extending the sidings 25 to 30 cars longer than the average train lengths, trains can meet without either train being required to stop.



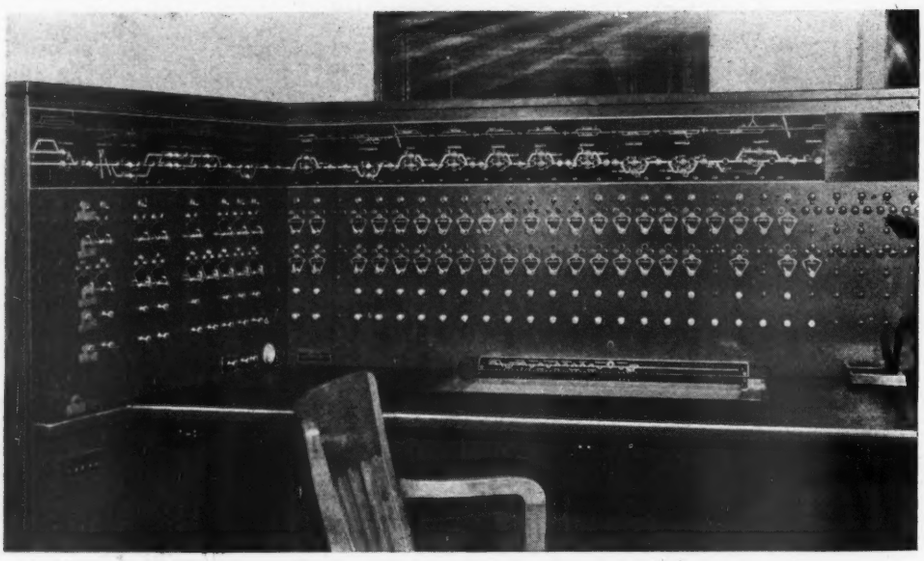
**Power Switches Controlled by C. T. C. Save Train Stops and Delays**

In previous methods of operation with shorter trains, passing tracks were spaced about five to six miles apart. With the increased train speeds and the use of signaling, it is being found that train time is saved by removing about half of the old passing tracks and spacing the longer ones 10 to 12 miles apart. One road which recently removed 12 passing tracks and lengthened 8 others on a 123-mile single track line found that these changes, together with signaling improvements, reduced the average running time of freight trains 45 minutes.

Investigations prove that modernization of track arrangements together with centralized traffic control will save from 1 to 1.5 minutes for each freight train on each mile of territory so equipped. On a 60-mile territory, this results in a saving of at least an hour by each train. For example, following the installation of C. T. C. on one sub-division of more than 100 miles, a 29 per cent reduction was made in the average time of trains enroute, notwithstanding the fact that the number of trains increased 13.1 per cent and the number of cars handled rose 18 per cent over previous peaks. Expressed in another way, a chief executive of one railroad has stated that new C. T. C. increases the capacity of single track to 75 per cent of that of double track.

By reducing the time spent on the road, locomotives can be dispatched on return trips sooner; thus fewer locomotives need be assigned to a division. After C. T. C. was installed on one engine district, eight locomotives were released for use on other divisions. On another road, where the engine pool for a division included a certain number of large modern locomotives and a few older ones of less capacity, practically all of the trains are now handled by the larger locomotives, thus further increasing their speed as well as reducing the number of trains. On one road, the installation of C. T. C. was a major factor contributing to the practicability of closing an engine house at an intermediate point on a division.

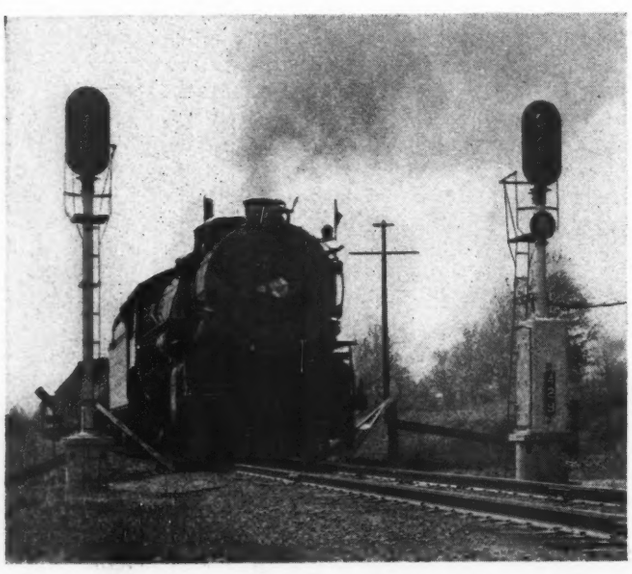
On a single-track line handling 20 to 30 or more trains daily, complete centralized traffic control, including power switches and standard arrangements of signals, is justified, as has been proven on more than 2,900 miles of lines. A problem, however, as found on lines handling a moderately heavy traffic of perhaps 10 to 15 trains daily, is to utilize arrangements which will reduce the cost sufficiently that C. T. C. can be installed at a price comparable with or not much in excess of the cost for complete absolute permissive automatic block signaling.



The Switches and Signals of an Entire Sub-Division Can Be Controlled from a C. T. C. Panel

Much thought has been given to this problem during the last two years. For illustration, the Chicago, Milwaukee, St. Paul & Pacific installed C. T. C. semi-automatic signaling, without power switches, on 60 miles of single track between Manilla, Iowa and Council Bluffs. A feature of the Milwaukee installation is the equipping of only certain sidings with complete semi-automatic signaling for the operation of through trains, whereas other short sidings were equipped with semi-automatic signals for leave-siding movements only. Furthermore, the over-all station-to-station blocks extend between the major sidings. In brief, this practice reduced the number of signals required and effected certain economies in control apparatus.

On some multiple-track lines, signals have been installed for train movements in either direction on all tracks, together with power-operated cross-overs at various points, all included in a centralized traffic control system. Where such facilities exist, as a high-speed train overtakes one of lower speed, the slower train can be diverted onto the other track to permit the faster train to run around it. Thus the slower train is kept in motion, rather than being stopped in a passing siding until the faster train has passed, thereby saving 20 min. or more for the slower train.



Automatic Block Signals Improve Safety and Aid Train Operation

## Complete Divisional Installations

The earlier installations of centralized traffic control were, for the most part, on comparatively short sections, ranging from 5 to 60 miles, thus relieving congestion in these bottlenecks. In general, the result was to transfer the train delays to other points on the division. The tendency now is to equip complete engine districts, either by extending existing projects or making complete new installations. Such has been the practice on the Burlington, the Canadian National and the Pennsylvania, and other similar projects are now under way or planned on several roads, including the Louisville & Nashville, the Union Pacific, the Denver & Rio Grande Western, the Southern Pacific and the Atchison, Topeka & Santa Fe. The rapid increase in the use of centralized traffic control as a means for expediting the transportation of freight, is evidenced by the fact that the C. T. C. now under way and planned totals more than half as much as has been installed during all the 17 years since its introduction.

## Yard Facilities

Having provided means for minimizing delays to cars while enroute on the line, provisions are being made also to reduce delays in yards. Modern freight classification yard equipment includes power machines for operating the switches, retarders for controlling the speed of cars when passing down the hump and into the classification tracks, and signals for directing hump operations and switching moves, all controlled from centrally-located towers, together with flood lighting so that operations can be carried on 24 hours each day. Such facilities have been in service for several years in more than 40 of the most important classification yards. The most recent installations, completed within the past few months, are in two yards on the Norfolk & Western.

As a further means for expediting traffic, arrival yards, with their attendant delays and additional switching moves, are being dispensed with in some instances by providing two or more long tracks in approach to the hump, on which arriving trains are pulled by road locomotives. Likewise, by arranging yard tracks suf-

(*Continued on page 1044*)

**New Names in Railway War Effort. Top —William L Batt, Chairman, Requirements Committee, WPB; left—Joseph L. Weiner, Deputy Director, Division of Civilian Supply and Civilian Supply Member, Requirements Committee, WPB; right—Andrew L. Stevenson, Chief, Transportation Branch, WPB.**

# Materials Vital To Sustained Railway Effort

## Importance of supplies grows as carriers shoulder record freight load—Government promises more allocations

AS the nation becomes more deeply involved in war and the railroads—jugular veins of the nation's military might—again pulsate under the full load of the country's military and civilian commerce, the role of materials in railway operation becomes more sharply defined and it becomes more clearly apparent that the flow of supplies to the railroads must not be interrupted. The importance of the problem grows, moreover, as the government assumes increased control of the production and distribution of materials, and it is no accident that the material needs of the railroads are now being discussed in the highest places.

Examination of the railway material situation at this stage of the war is restricted by the constantly narrowing sources of official information and the infrequency and incompleteness with which the facts are revealed. In the face of growing scarcities of steel and other materials of war, however, it is reassuring that railway supply forces have managed to keep their lines of supply open, are reasonably well provided for the present against interruptions to traffic for want of material and that both railroad and government agencies are now working more harmoniously and effectively to provide the necessary supplies. The promise of more allocations by WPB to prevent shortage is among the most recent developments.

In the business of supplying railroads, the emphasis is usually placed on acquisitions of new locomotives and cars, with the result not only that the quantity and diversity of materials entering into the construction of new equipment are inadequately appreciated, but also that even railway men not immediately responsible for railway purchases have little conception of the volume and the variety of materials required for maintenance and repair. Proposals to buy new equipment ordinarily mean new business to the banker and manufacturer and mean increases in the car supply to railway transportation forces and shippers. Only when restrictions in the flow of materials arise which threaten the safety, speed and continuity of operations, as at present, is the importance of maintenance recognized and then the sums involved are sometimes regarded as evidences of waste and extravagance because of their size.

Lively interest has been taken in the original program of the railroads to build 113,594 freight cars and 974 locomotives between October, 1941, and October, 1942,

## JOSEPH L. WEINER* SAYS

**The railroads have a tough job ahead of them. The Nation is tackling the toughest job in its history, and the railroads have to move the goods with which the job is to be done. What is more, while army and navy traffic is growing steadily, everything that moves on rubber is being curtailed, and shipping along the coasts and between the coasts is unsafe and tight. The railroads have to move a larger proportion of our mounting total of materials and goods, and they have to move it in longer, heavier-loaded hauls.**

**To do this job takes not only organization and experience, imagination and labor—it also takes vast quantities of materials. We in the War Production Board place railroads at the very top of our list of essential civilian needs. One out of every ten tons of steel being made in the United States in 1942 will go to the railroads.**

**The railroads could use more. We have all recognized the record the railroads have built up in the presentation of their case for needed steel. But the fact remains that after we have allocated as much steel as we possibly can for maintenance of railway structures and equipment, to locomotive building and to new freight cars, the railroads could effectively use a great deal more steel. But that steel is needed with no less urgency—perhaps even more—for the building of warships and merchant vessels and war plants, for guns and shells and tanks. The types of steel needed most by the railways, especially plates, structural shapes and castings, are those which are tightest in the whole war program. There is no serious demand for steel which is not being cut, and most demands are being cut far more heavily, of course, than that of the railroads.**

**Raw material shortages are paralleled by a shortage of facilities for making the implements of victory. Some of the shops and machines that turn out railroad equipment, so far as they can safely be diverted from railway work, must now build tanks, gun turrets, gun mounts, armor plate and artillery. In the other countries at war, a much larger share of all locomotive and car-building facilities has already been converted to direct military production. The American railways would do no less.**

**The railroads have begun to make their adjustments to the tight situation. In the hard days ahead, they will be working their locomotives and freight cars harder. They will be loading cars fuller. They will be routing freight more directly. They will, as far as it can be done, pool their locomotive equipment. They will smooth out some of the seasonal pinches. They will be speeding yard and terminal switching. They will be loading and unloading trains faster. They will speed the assembling and breaking up of freight trains. They will, so far as necessary, postpone some traffic movement and curtail nonessential passenger and freight traffic.**

**Every essential industry will have its needs for raw materials, machines and labor carefully examined all the time by the Division of Civilian Supply and the War Production Board, in collaboration with the ODT, as we go along. We are sure that each examination of the railroads' needs in the months to come will show that railroad management has been squeezing every possible ton-mile out of its available equipment.**

**Our railroads have to face shortages of steel and facilities, but not, we expect, of imagination and efficiency and powers of adjustment.**

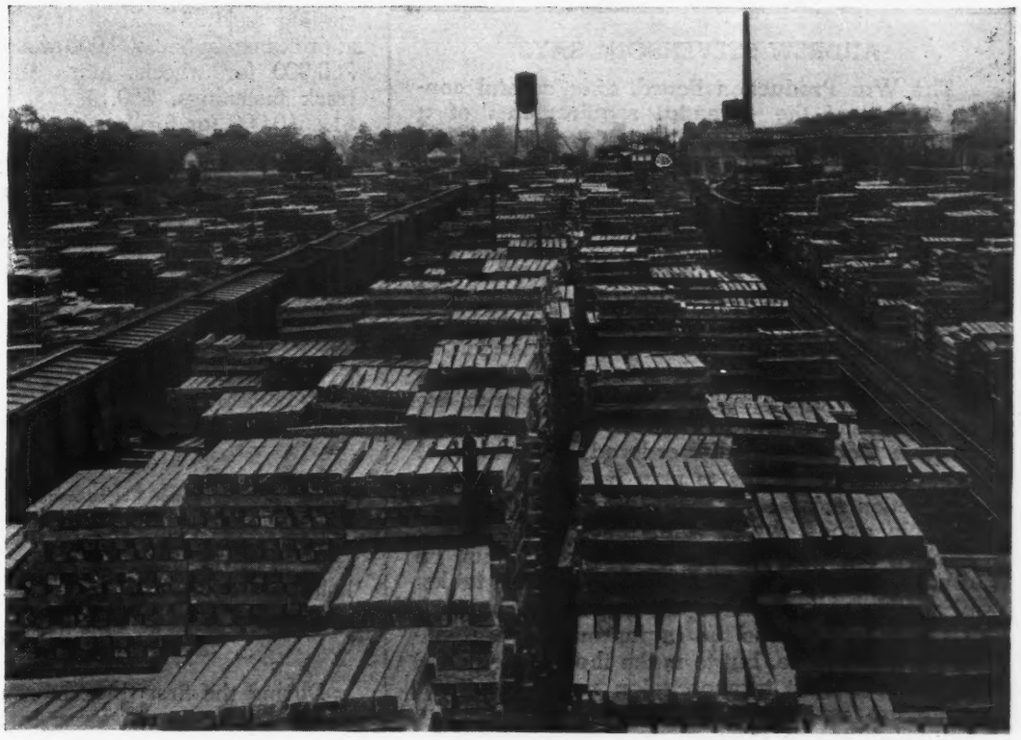
* Civilian Supply Member, Requirements Committee, WPB.

and to their later proposals to build 121,827 freight cars by December, 1942, and also in the formulation and progress of the government's program, as recently revised, to allow and assure the construction of 62,100 new freight cars and 1,226 locomotives this year, exclusive of equipment under construction or authorized for military projects or export. Less concern, however, has been expressed over the materials for the operation and upkeep of 1,945,000 freight cars (including private cars) and 41,400 locomotives in service, the 235,000 miles of main line and over 400,000 miles of all tracks, together with the bridges, tunnels, shops, water and power stations and the machinery which compose this country's railway plant.

Some 18 tons of iron and steel are required for an average box car, 19 tons for an average hopper car, 225 tons for an average steam locomotive, 100 tons for an average diesel-electric locomotive and 200 tons for an average electric locomotive, and 25 per cent of the weight of a diesel-electric locomotive is copper. With the drain on these and other metals for guns, tanks and ships for the military forces for this and other countries, limitations on the amount of this construction that will be permitted was not unexpected, particularly following the extensive conversion of railway manufacturing plants to produce strictly military materials. Fortunately, railway equipment is relatively long lived. It is not uncommon for steam locomotives to run 300,000 miles before heavy repairs, for boiler tubes to run beyond 4 years before renewals and for this class of power to run 20 to 30 years before replacement where obsolescence has been ignored. They must be fueled and lubricated, however, and their depreciation is rapid without the constant application of new materials to overcome the effect of wear and tear. Freight cars last 20 to 30 years before they are junked and the wheels under them are guaranteed for 10 years and average 150,000 miles of wear before replacement, but neither the 2,000,000 cars which are handling the rail-born traffic, civilian and military, nor the 16,000,000 wheels under them can be continued in service without constant expenditures for maintenance and the same is true of the 60,000,000 tons of rail and more than 1,000,000,000 ties over which the equipment runs.

### Materials and Train Wrecks

Train wrecks are often the result of material failures. It takes only a defective wheel or a broken rail to derail a train, causing death and injury to persons, damage to freight and serious delays to vital traffic moving on fast schedules. Government inspectors are constantly examining the condition of locomotives and the number found defective each year has been constantly decreasing under good maintenance. In 1941, only 9 per cent of the locomotives examined were found defective, which is com-



50 Million Ties a Year to Maintain Track

pared with 58 per cent in 1918, and 67 per cent in 1923. Yet, 9,889 steam and other locomotives were found defective and 581 were ordered out of service because of defects in 1941.

Train wrecks caused by derailments have also declined in recent years. There were only 19 per cent as many in 1939, the last year of record, as in 1923. Derailments in 1939, however, totaled 3,224, of which 2,363 were freight train derailments, and it is significant that 1,878, or 58 per cent of the total, derailments in that year were caused by defects in or failures of the equipment or track. The total of 592 of the wrecks were caused by defective wheels and axles, 122 by brake equipment, 55 by couplers, 41 by car bodies, 290 by defective rails and 170 by defective frogs and switches. In 1918, derailments from defects in material and equipment totaled 9,068. Increases in the number of trains wrecked by material failures would be costly at this time.

Railway Requirements Include Much Material for New and Old Cars

## Purchases Under Federal Control

Somewhat to their own embarrassment in recent months, the railroads, being consumers of new materials and supplies, have not been in the habit of keeping other than financial details of their purchases and physical details of their requirements from year to year are lacking except with rail and a few other materials. In 1932, however, when the railroads made no additions to their equipment and pared expenses to the bone and even robbed idle equipment to obtain parts for active equipment, they spent $445,000,000 directly with producers for materials and supplies, of which $100,550,000 consisted of products of iron and steel, while in the five notoriously lean years from 1930 to 1935, their purchases of fuel and materials averaged $558,200,000 a year, including $148,049,000 of iron and steel. In 1919, when the railroads were operated by the govern-

**Wrecks Caused by Material Defects ***

| | Derailments | |
|---|---|---|
| | 1939 | 1918 |
| Locomotive parts | 22 | —† |
| Trucks | 260 | 925 |
| Wheels and axles | 592 | 2,682 |
| Power brakes | 24 | — |
| Brake rigging | 98 | 782 |
| Couplers | 55 | —† |
| Draft rigging | 92 | 682 |
| Car bodies and other parts of equipment | 41 | 1,444 |
| Total Equipment Failures | 1,184 | 6,515 |
| Bridges, trestles, culverts, and tunnels | 3 | —† |
| Ties and tie plates | 25 | 105 |
| Rails and joints | 290 | 625 |
| Frogs and switches | 170 | 461 |
| Interlocking and block signal system | 2 | —† |
| Other track failures | 204 | 1,362 |
| Total Track Failures | 694 | 2,553 |
| Total Equipment and Track Failures | 1,878 | 9,068 |

* Interstate Commerce Commission.
† Not Available.

## ANDREW STEVENSON* SAYS

**The War Production Board, after careful consideration of the essential requirements of a country engaged in the greatest war in history, has announced its determination to allocate material for new construction and maintenance of way and structures for the Nation's railroads this year. It is now the duty of the railroads, the car builders and the locomotive builders to see to it that every ounce of this precious material is utilized to the utmost to provide efficient transportation for both war and civilian demands.**

**The steel situation is serious. Demands of the Army, Navy and Maritime Commission upon the steel industry are growing daily. The War Production Board recently ordered thousands of manufacturing plants to stop using steel in the production of practically all types of consumers' durable goods, which will affect every household in the United States. This steel must be diverted from civilian products to the tanks, planes, guns and ships essential to victory.**

**No one questions the importance of the railroads in wartime, but to make the most efficient use of our vast transportation network with a minimum amount of critical material, it is the responsibility of the railroads to use their ingenuity to the utmost to make improvements in operations so that the substitution of less critical materials can be hastened wherever possible. Substitution and conservation are imperative if we are to make the most of what we have.**

**The Transportation Equipment Branch of the War Production Board is staffed by men familiar with every phase of the transportation industry. The Branch maintains the closest contact with other branches dealing with raw materials. We are ready at all times to offer the railroads and the railroad equipment industry guidance on any problem, whether it relates to materials or to production. Our only aim is to see that the job is done. We are confident that, with the continued co-operation of the railroad industry, it will be done.**

* Chief, Transportation Equipment Branch, War Production Board.

ment, they ordered $380,036,000 of new locomotives and cars and spent $1,380,494,000 for fuel and materials. In 1923, new equipment expenditures totaled $369,495,000 and those for materials and fuel $1,738,703,000. In the five years previous to 1930, purchases of new equipment averaged $233,677,000 and of fuel and materials $1,318,867,000, including $420,998,000 of iron and steel. In the five years ending 1940, equipment purchases averaged $192,507,000 a year, fuel and materials $794,079,000 and iron and steel products $277,236,000.

Last year, new equipment purchases came to $414,690,000 and fuel and materials to $1,163,029,000, including $461,785,000 of iron and steel. In this year, approximately $52,309,000 was spent for steel rails, $36,780,000 for wheels, axles and tires, $68,456,000 for track fastenings, $50,149,000 for bar and sheet steel, $19,610,000 for forgings for locomotives and cars, $66,563,000 for locomotive and car castings, $16,799,000 for bolts and $10,124,000 for pipe.

**Locomotives Examined and Found Defective ***

| | 1941 | 1940 | 1939 | 1938 | 1937 | 1936 |
|---|---|---|---|---|---|---|
| Number of inspections | 111,233 | 107,138 | 110,187 | 109,210 | 103,648 | 100,447 |
| Number found defective | 9,889 | 8,863 | 9,359 | 11,324 | 12,730 | 11,778 |
| Number ordered out of service | 581 | 503 | 482 | 688 | 958 | 863 |
| Number of defects found | 38,596 | 33,443 | 34,186 | 42,983 | 50,737 | 48,127 |

* Interstate Commerce Commission.

**Causes of Train Accidents ***

| Year | Total | Defects in or failures of equipment | Defects in or improper maintenance of way and structures |
|---|---|---|---|
| 1918 | 24,695 | 7,828 | 2,721 |
| 1929 | 17,185 | 6,643 | 2,095 |
| 1930 | 12,313 | 5,024 | 1,381 |
| 1931 | 8,052 | 3,174 | 911 |
| 1932 | 5,770 | 2,332 | 667 |
| 1933 | 5,623 | 2,324 | 656 |
| 1934 | 6,023 | 2,517 | 662 |
| 1935 | 6,551 | 2,679 | 804 |
| 1936 | 8,286 | 3,411 | 1,004 |
| 1937 | 8,412 | 3,120 | 1,065 |
| 1938 | 5,682 | 2,073 | 720 |
| 1939 | 6,074 | 2,039 | 709 |

* Interstate Commerce Commission.

### First Quarter Deliveries

During the first three months of this year, based on special reports to this paper by most of the railroads, the railroads received in the aggregate $325,160,000 of materials, consisting of $98,422,000 of fuel and $226,738,000 of iron and steel and other materials. The deliveries totaled $107,690,000 in January, $102,209,000 in February and $115,261,000 in March, and were approximately $70,000,000 larger than in the first three months of 1941.

During January, after successive revisions downward, the railroads and railway equipment builders estimated that they would require 6,613,130 net tons of iron and steel during 1942 to build the equipment the railways needed and to provide for the maintenance of the equipment and other facilities in service. This tonnage included approximately 5,560,000 tons of rolled steel products. This was about equal to the corresponding tonnage of rolled steel products consumed by the railroad industry in 1941, but was smaller by over 1,000,000 tons a year than the average annual consumption previous to 1929, and is contrasted with an average of 4,563,000 tons consumed by the railroads during the last 19 years, including the depression years. The minimum requirements for the year, moreover, will probably take only 6.8 per cent of the entire production of finished steel, which is the lowest percentage on record except in 1936. In 1923, the consumption of finished steel by railroads was 25.3 per cent of the total production and in 1941, it represented 9.7 per cent of the production. Up to the

**Railroad Consumption of Rolled Steel ***

| | Gross Tons Shipped (000) | Per Cent of Total Production | | Gross Tons Shipped (000) | Per Cent of Total Production |
|---|---|---|---|---|---|
| 1923 | 8424 | 25.3 | 1935 | 1751 | 7.3 |
| 1924 | 7196 | 25.6 | 1936 | 3645 | 10.8 |
| 1925 | 7809 | 23.4 | 1937 | 4184 | 11.4 |
| 1926 | 7656 | 21.6 | 1938 | 1289 | 6.1 |
| 1927 | 6232 | 19.0 | 1939 | 3250 | 8.3 |
| 1928 | 6119 | 16.3 | 1940 | 4019 | 8.3 |
| 1929 | 7288 | 17.7 | 1941 | 5814 | 9.7 |
| 1930 | 4679 | 15.9 | | | |
| 1931 | 2710 | 14.1 | Av. 19 yr. | 4563 | 6.9 |
| 1932 | 1050 | 10.0 | | | |
| 1933 | 1317 | 7.9 | 1942[1] | 5867 | 6.8 |
| 1934 | 2271 | 12.0 | | | |

* Direct shipments—excluding castings and unclassified shipments of rolled steel.
[1] A.A.R. estimate.

present, the government has agreed to furnish the railroads not to exceed 1,000,000 tons of rails this year and has so far allocated approximately 3,174,000 tons of steel, including 1,767,000 tons for building and repairing equipment and 1,306,000 tons for maintenance of way.

Recent purchases have been accompanied by increases in inventories and some roads have been criticized for their accumulations. The aggregate increases, however, include increases in coal which the government has urged the roads to store. They also include quantities of materials for new equipment programs which have been suspended recently by government orders. The aggregate inventories are still much lower than before the depression and during the first world war and do not represent more than a two-months excess supply at present rates of material consumption.

## More Rationing

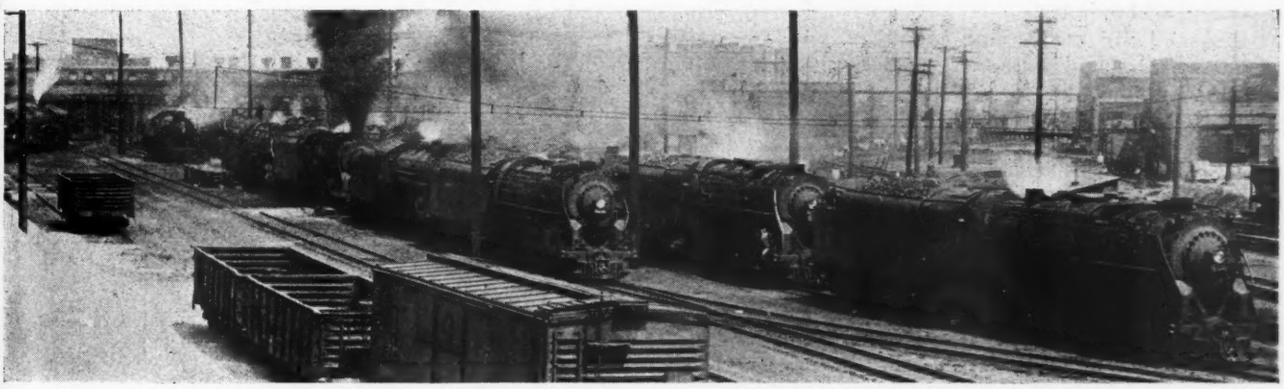
Few materials remain the production and distribution of which are not closely controlled by war agencies, and railroads and railway manufacturers are circumscribed by increasingly rigid regulations which are constantly in process of change. The War Production Board now decides how many cars and locomotives may be built, who shall build them, who shall supply the materials for them and who shall get them. Steel plate for cars, locomotive fire boxes and boilers, together with rail and fastenings, are also subject to allocation, both as to the amount which may be furnished to railroads and the sizes and the quantities which each railroad may receive in any stated period. Other items in great demand are rapidly being handled in the same way. Under present orders, the Office of Defense Transportation is authorized and expected to assist in determining the over-all requirements of the railroads, but the conditions under which the materials may be obtained and the quantities of scarce materials which may be produced for and delivered to the railroads are determined by WPB.

Over-all allocations come within the province of the Material Requirements committee. The chairman is William L. Batt, with Joseph L. Weiner, deputy director, Division of Civilian Supply, WPB, representing civilian supplies which include the supplies for railroads. The other members of this committee are Maj. Gen. H. K. Rutherford, Service of Supply, U. S. Army; Rear Admiral Henry Williams, Office of Procurement of Materials, U. S. Navy; Rear Admiral H. L. Dickery, commissioner, U. S. Maritime Commission; Dean Acheson, Assistant Secretary of State; Col. R. B. Lord, assistant director and chief of operation, Board of Economic Warfare; Thomas B. McCabe, deputy, Lend Lease Administration; E. B. George, deputy chairman, Division of Materials, and chief of the Research Staff of the Requirements Committee, WPB; Melvin G. de Chazeau, assistant chief, Requirements Committee Research Staff, WPB; and Frederick Rowe, secretary. Details in connection with the administration of allocations for railroads, as approved by WPB, and all other direct relations with railroads and railway supply industries come within the province of the Transportation Branch of WPB, of which Andrew Stevenson is chief.

Since March 16, the priority rules under which railroads have been obtaining their supplies have been liberalized, technically at least, to give an A-1-a rating for deliveries of materials needed for emergency repairs. Other high ratings are available, where necessary, on the delivery of raw material to railroads. An A-3 rating is available for materials essential for track, structures, signals and for freight car and locomotive repairs, and an A-8 rating covers supplies for general maintenance and operation. These ratings replace the A-3

**3 Months Purchases—Materials and Fuel**

| 1942 | Fuel (000) | Rail (000) | Cross ties (000) | Other Material (000) | Total (000) | Total Less Fuel (000) |
|---|---|---|---|---|---|---|
| January | $32,301 | $2,230 | $5,001 | $68,158 | $107,690 | $75,389 |
| February | 31,763 | 3,004 | 4,777 | 62,665 | 102,209 | 70,446 |
| March | 34,358 | 4,036 | 8,914 | 67,953 | 115,261 | 80,903 |
| 3 mos. | 98,422 | 9,270 | 18,692 | 198,776 | 325,160 | 226,738 |
| 1941 | | | | | | |
| January | 27,261 | 3,464 | 3,472 | 45,457 | 79,654 | 52,393 |
| February | 27,901 | 5,297 | 3,514 | 43,467 | 80,179 | 52,278 |
| March | 31,121 | 5,168 | 4,087 | 54,070 | 94,446 | 63,325 |
| 3 mos. | 86,283 | 13,929 | 11,073 | 142,994 | 254,279 | 167,996 |
| 1940 | | | | | | |
| January | 24,977 | 3,529 | 4,128 | 45,593 | 78,227 | 53,250 |
| February | 24,219 | 4,815 | 3,928 | 39,939 | 72,901 | 48,682 |
| March | 21,880 | 6,043 | 4,634 | 42,655 | 75,212 | 53,332 |
| 3 mos. | 71,076 | 14,387 | 12,690 | 128,187 | 226,340 | 155,264 |
| 1939 | | | | | | |
| January | 23,377 | 483 | 2,445 | 27,374 | 53,679 | 30,302 |
| February | 23,063 | 2,934 | 2,632 | 26,721 | 55,350 | 32,287 |
| March | 24,361 | 4,631 | 3,660 | 33,467 | 66,119 | 41,758 |
| 3 mos. | 70,801 | 8,048 | 8,737 | 87,562 | 175,148 | 104,347 |



**Live Locomotives Must Be Kept in Repair**

**Purchases by Railroad Administration—Year 1919**

| | |
|---|---|
| Locomotives and cars ordered* | $380,036,000 |
| Rail | 64,915,000 |
| Ties | 127,833,000 |
| Fuel | 491,131,000 |
| Miscellaneous material | 696,615,000 |
| Total | $1,760,530,000 |

* Ordered by the Railroad Administration in 1918 but not delivered until 1919.

rating previously afforded for building and repairing certain locomotives and freight cars and supersede the A-10 rating previously used in obtaining materials for general maintenance. To obtain these ratings, however, railroads must not only show the approximate quantities of each kind of material which they will require during a three-months period, but also must furnish quarterly statements of the materials they have in stock, while manufacturers must do somewhat the same thing in obtaining materials to fill railway orders. Present rules also require the railroads to promote conservation in the use of materials by simplifying specifications so as to eliminate the use of scarce materials so far as possible, and the condition under which they now obtain new rail requires the release of approximately the same mileage of old rail for the use of military forces or for other disposition directed by the government.

At the present time, many companies upon which the railroads have always depended for their specialized needs are partially or completely shut down by the severe curtailment of new car and locomotive construction, and railroads are greatly disturbed over rulings which prevent them from even using materials in stock to complete the construction of new equipment, particularly when much of this material cannot be used elsewhere without re-processing. One road has enough of this material to build 100 new cars, another to build 170 new cars and still another road quantities of material for over a thousand cars. The railroads also know from experience that new schemes of allocating and distributing railway supplies develop unexpected complications, particularly when they require the reshuffling of long established trade relationships. It is also pointed out that uncertainties experienced by the railroads in obtaining essential materials as scheduled has not been improved.

The railroads are keenly aware of the seriousness of the emergency confronting the nation and of the lack of materials for all demands, and they have repeatedly been commended in Washington for their attitude and the manner in which they have adjusted themselves to the conditions under which materials must now be obtained. Indicative of the attitude of railroads is a public statement recently circulated by the Illinois Central under the title "War Sets New Test for Railroads," which reads as follows:

"In a decision which calls for loyal acceptance by shippers and travelers as well as by railroaders, the War Production Board has severely curtailed the use of materials to build railway equipment. There will be no further authority to build passenger cars, and the building of locomotives and freight cars will be held below the numbers which the railroads figured as being required to meet increasing demands for transportation.

"It was a choice between guns and transportation. That choice must have been exceedingly difficult to make. We know there is a fair, urgent and complete presentation of transportation requirements. The decision rested, as it had to, with those responsible for the most effective use of all our nation's resources in critical materials, manufacturing facilities and labor supply. These men have complete information regarding war production and must direct all requirements toward the maximum effort to win the war.

"We all realize and agree that the needs of war come

(*Continued on page 1040*)

**Railway Purchases—1923 to 1941**

| | Fuel (000) | Forest Products (000) | Iron and Steel (000) | Other Material (000) | Total Material (000) | Equipment* (000) |
|---|---|---|---|---|---|---|
| 1923 | $617,800 | $232,511 | $464,955 | $423,437 | $1,738,703 | $369,495 |
| 1924 | 481,656 | 180,872 | 365,610 | 324,917 | 1,353,055 | 435,483 |
| 1925 | 462,620 | 170,305 | 419,254 | 339,863 | 1,392,042 | 311,810 |
| Av. | 520,692 | 194,563 | 416,606 | 362,739 | 1,494,600 | 372,263 |
| 1926 | 473,353 | 186,291 | 507,302 | 392,085 | 1,559,031 | 246,762 |
| 1927 | 438,821 | 175,729 | 432,604 | 348,774 | 1,395,928 | 203,596 |
| 1928 | 384,608 | 160,794 | 397,544 | 328,395 | 1,271,341 | 174,436 |
| 1929 | 364,392 | 157,551 | 437,840 | 369,752 | 1,329,535 | 397,121 |
| 1930 | 306,500 | 134,600 | 329,700 | 267,700 | 1,038,500 | 146,471 |
| Av. | 393,535 | 162,993 | 420,998 | 341,341 | 1,318,867 | 233,677 |
| 1931 | 244,500 | 76,250 | 202,100 | 172,150 | 695,000 | 28,873 |
| 1932 | 178,250 | 52,200 | 100,550 | 114,000 | 445,000 | 2,623 |
| 1933 | 179,150 | 41,185 | 112,685 | 124,730 | 457,750 | 5,857 |
| 1934 | 217,294 | 64,271 | 159,758 | 158,901 | 600,224 | 66,850 |
| 1935 | 232,723 | 58,037 | 165,150 | 137,217 | 593,127 | 35,696 |
| Av. | 210,383 | 58,389 | 148,049 | 141,399 | 558,220 | 27,980 |
| 1936 | 271,397 | 76,770 | 278,223 | 175,914 | 802,304 | 240,594 |
| 1937 | 293,540 | 104,302 | 356,367 | 204,727 | 958,936 | 194,153 |
| 1938 | 243,889 | 57,156 | 152,411 | 129,355 | 582,811 | 74,006 |
| 1939 | 257,879 | 70,412 | 278,787 | 163,295 | 770,373 | 188,838 |
| 1940 | 273,677 | 82,926 | 320,390 | 178,980 | 855,973 | 264,943 |
| Av. | 268,076 | 78,313 | 277,236 | 170,454 | 794,079 | 192,507 |
| 1941 | 349,848 | 105,239 | 461,785 | 246,157 | 1,163,029 | 414,690 |
| Av. 19 yr. | 330,100 | 115,126 | 312,790 | 242,124 | 1,000,140 | 200,121 |

* Estimated value of orders for new cars and locomotives placed with contract builders.

**Causes of Locomotive Failures ***

| | 1941 | 1940 | 1939 | 1938 | 1937 | 1936 |
|---|---|---|---|---|---|---|
| Air compressors | 684 | 567 | 518 | 689 | 766 | 740 |
| Arch tubes | 31 | 20 | 28 | 66 | 105 | 74 |
| Ashpans and mechanism | 67 | 37 | 67 | 72 | 80 | 79 |
| Axles | 5 | 3 | 2 | 13 | 10 | 13 |
| Blow-off cocks | 205 | 191 | 204 | 226 | 199 | 236 |
| Boiler checks | 313 | 288 | 279 | 301 | 382 | 356 |
| Boiler shell | 271 | 266 | 272 | 331 | 347 | 383 |
| Brake equipment | 1,945 | 1,506 | 1,577 | 2,044 | 2,322 | 2,480 |
| Cabs, cab windows, and curtains | 1,087 | 1,078 | 943 | 1,226 | 1,807 | 1,638 |
| Cab aprons and decks | 307 | 277 | 260 | 326 | 466 | 450 |
| Cab cards | 97 | 101 | 92 | 109 | 145 | 166 |
| Coupling and uncoupling devices | 74 | 53 | 60 | 73 | 74 | 65 |
| Crossheads, guides, pistons, and piston rods | 858 | 815 | 739 | 905 | 1,160 | 1,056 |
| Crown bolts | 97 | 54 | 47 | 59 | 76 | 63 |
| Cylinders, saddles, and steam chests | 1,332 | 1,320 | 1,232 | 1,645 | 2,206 | 1,717 |
| Cylinder cocks and rigging | 438 | 447 | 418 | 585 | 729 | 605 |
| Domes and dome caps | 94 | 78 | 90 | 109 | 101 | 114 |
| Draft gear | 620 | 508 | 450 | 740 | 522 | 513 |
| Draw gear | 347 | 306 | 360 | 479 | 560 | 451 |
| Driving boxes, shoes, wedges, pedestals, and braces | 1,348 | 1,243 | 1,330 | 1,688 | 1,637 | 1,712 |
| Firebox sheets | 224 | 191 | 238 | 244 | 371 | 295 |
| Flues | 150 | 147 | 165 | 159 | 225 | 178 |
| Frames, tail pieces, and braces, locomotive | 863 | 665 | 708 | 1,001 | 1,053 | 997 |
| Frames, tender | 83 | 78 | 71 | 131 | 120 | 113 |
| Gages and gage fittings, air | 183 | 132 | 155 | 230 | 261 | 257 |
| Gages and gage fittings, steam | 236 | 211 | 226 | 279 | 324 | 350 |
| Gage cocks | 373 | 400 | 361 | 451 | 538 | 579 |
| Grate shakers and fire doors | 430 | 273 | 252 | 403 | 470 | 400 |
| Handholds | 433 | 333 | 349 | 405 | 510 | 502 |
| Injectors, inoperative | 39 | 30 | 26 | 26 | 38 | 40 |
| Injectors and connections | 1,882 | 1,330 | 1,457 | 1,784 | 2,020 | 2,085 |
| Inspections and tests not made as required | 7,215 | 6,218 | 6,645 | 8,204 | 9,638 | 9,005 |
| Lateral motion | 357 | 313 | 243 | 325 | 446 | 404 |
| Lights, cab and classification | 50 | 49 | 50 | 48 | 90 | 78 |
| Lights, headlight | 190 | 180 | 177 | 257 | 313 | 251 |
| Lubricators and shields | 196 | 185 | 200 | 212 | 254 | 255 |
| Mud rings | 187 | 213 | 248 | 203 | 272 | 237 |
| Packing nuts | 508 | 418 | 408 | 448 | 487 | 508 |
| Packing, piston rod and valve stem | 675 | 660 | 739 | 913 | 1,393 | 1,133 |
| Pilots and pilot beams | 142 | 140 | 104 | 154 | 133 | 178 |
| Plugs and studs | 156 | 156 | 179 | 238 | 238 | 236 |
| Reversing gear | 387 | 320 | 317 | 404 | 492 | 463 |
| Rods, main and side, crank pins, and collars | 1,565 | 1,199 | 1,293 | 1,669 | 2,348 | 2,093 |
| Safety valves | 68 | 61 | 97 | 125 | 132 | 125 |
| Sanders | 490 | 415 | 432 | 536 | 655 | 678 |
| Springs and spring rigging | 2,597 | 2,174 | 2,340 | 2,901 | 3,172 | 3,008 |
| Squirt hose | 62 | 50 | 75 | 94 | 133 | 134 |
| Stay bolts | 239 | 227 | 181 | 211 | 276 | 279 |
| Stay bolts, broken | 198 | 271 | 258 | 380 | 542 | 520 |
| Steam pipes | 385 | 255 | 285 | 410 | 446 | 526 |
| Steam valves | 110 | 106 | 115 | 141 | 165 | 227 |
| Steps | 555 | 449 | 490 | 631 | 678 | 615 |
| Tanks and tank valves | 952 | 768 | 837 | 955 | 1,009 | 877 |
| Telltale holes | 59 | 95 | 58 | 67 | 79 | 127 |
| Throttle and throttle rigging | 688 | 647 | 638 | 685 | 909 | 760 |
| Trucks, engine and trailing | 636 | 598 | 628 | 762 | 785 | 861 |
| Trucks, tender | 773 | 705 | 665 | 907 | 1,018 | 1,108 |
| Valve motion | 580 | 506 | 554 | 722 | 798 | 824 |
| Washout plugs | 445 | 478 | 487 | 626 | 598 | 714 |
| Train-control equipment | 1 | 2 | 5 | 11 | 12 | 6 |
| Water glasses, fittings, and shields | 788 | 753 | 690 | 915 | 1,049 | 1,118 |
| Wheels | 536 | 554 | 466 | 577 | 803 | 790 |
| Miscellaneous—Signal appliances, badge plates, brakes (hand) | 785 | 564 | 610 | 684 | 759 | 608 |
| Total number of defects | 37,691 | 32,677 | 33,490 | 42,214 | 49,746 | 47,453 |

* Steam Locomotives, June to June, I. C. C.

# Manpower—A Pressing Problem

## Inroads of selective service and of war production plants create serious situation

**By Otto S. Beyer, Director,**

Division of Transport Personnel,
Office of Defense Transportation

THE average shipper is more concerned with possible shortages in the cars necessary to move his goods than in the men necessary to keep freight trains rolling. To a nation that has just emerged from a ten-year struggle with problems of depression unemployment the notion that there may be more jobs than men to fill them is not only novel but startling. The plain fact is that there is a manpower shortage looming on the industrial horizon that will affect the railroads as well as most other essential industries and that in some areas may even extend to unskilled labor.

The demands of war and of war industries for manpower are responsible for this situation. By the end of 1941 the military forces of this country numbered around two million men. By the end of 1942 this number will be more than doubled. It is entirely possible that seven to ten million American soldiers and sailors will be required to win this war. On the home front in the war production industries the need for manpower is even greater. It is estimated that up to ten million more men and women must be recruited for war plants by the end of 1942 than were employed in these plants at the beginning of the year.

It does not require the gift of prophecy to know that the railroads are going to feel the pinch. Estimates prepared by the Office of Defense Transportation indicate that 117,000 new railroad jobs must be filled between May 1 and December 31, 1942, in order to take care of war-time expansion and the October carloading peak. But this is not all. Turnover during the remainder of the year, excluding consideration of the more casual railroad jobs, will require the hiring of 167,000 men; 22,000 more will be necessary to replace men inducted into the army by selective service; and 14,000 will be required to take care of vacations which many railroad workers will be taking for the first time under the Emergency Board award of December, 1941. All this adds up to 320,000 new railroad hirings for the remainder of 1942. If casual jobs of a few days to a few weeks' duration are included, the total number of new hirings for the entire 12 months of 1942 will approach 650,000.

The rapid growth of war production industries and the induction into military service of hundreds of thousands of young men have finally focused attention upon the manpower problem. For the first time in more than two decades, the railroads are faced with the necessity of expansion without a reserve of trained employees to draw upon.

### Railroads Report on Personnel Shortages

In March of this year the Association of American Railroads undertook a survey of personnel shortages in the railroad industry at the request of the Office of Defense Transportation. The railroads were asked to report the occupations in which shortages existed at the time of the survey and in which shortages were expected before July 1, 1942. They were asked to indicate the number of positions which they were un-

### *Railways Need Men*

**320,000 new railway employees must be recruited before 1943 rolls around, to fill new jobs, overcome turnover, replace selectees and comply with new vacation rules.**

**Occupational deferment is not the answer; the railway industry must contribute its share of men to the army.**

**The railways must meet their labor problems by increasing the effectiveness of existing employees, securing men released from related industries and recruiting new personnel.**

**Spread work measures must be eliminated for the duration. Former railway employees provide a source of supply. Retirement provisions may be modified.**

**The railways must recruit more women for a variety of occupations.**

able to fill because of the lack of qualified personnel and to state the occupations in which seniority rosters had been substantially exhausted. The railroads were also asked to what extent they had utilized their opportunities for obtaining occupational deferment under the Selective Service Act and to what extent local selective service boards had granted these requests.

The survey showed that the railroads are already experiencing difficulty in maintaining their labor forces in a fairly large number of skilled occupations. The most serious shortages of personnel were reported in shop craft occupations. Railroads representing 91 per cent of all employment on Class I line-haul and switching and terminal companies reported shortages of machinists. Railroads employing 75 per cent or more of all employees on Class I carriers reported shortages of blacksmiths, boilermakers, carmen, electrical workers, and sheet metal workers. Other important occupations in which railroads representing more than 75 per cent of total employment of Class I carriers reported shortages were telegraphers, telephoners and towermen, road-freight and yard brakemen, road firemen, signalmen and signal maintainers, and clerks. These reports covered both existing and anticipated shortages, but in most cases referred to conditions as of the date the reports were prepared.

In most of the shortage occupations, there is no opportunity to fill vacancies from lists of furloughed employees. In fact, nearly all of the railroads reporting existing or expected shortages in shopcraft occupations, and among signalmen and signal maintainers, and telegraphers, telephoners, and towermen, also reported that seniority rosters for these occupations had been substantially exhausted by February 15, 1942. To a somewhat less extent this was also true of brakemen, firemen, and clerks. Even in occupations requiring relatively less skilled men, such as helpers in the maintenance of way and equipment departments and section men, a substantial number of railroads reported that seniority rosters had been exhausted.

**Many New Enginemen and Trainmen Are Needed by the Railways To Handle Today's Peak Traffic**

A somewhat disturbing aspect of the railroad manpower situation is the exaggerated emphasis which has been placed upon the importance of occupational deferment under the Selective Service Act in meeting difficulties caused by personnel shortages. So long as the railroads believe that occupational deferment constitutes the major answer to the problem of personnel shortage, there is danger that other avenues of meeting this problem will not be fully explored.

In the first place, it is clear that up to January 1, 1942, the railroads had not lost many employees in the more important occupations, as a result of the operation of the selective service system. In a list of occupations selected by the railroads as most critical and covering nearly three-quarters of a million employees, only 8,845 employees had been inducted into the army under the Selective Service Act to January 1, 1942. This number represents slightly more than one per cent of the total number of employees in these occupations in January. Including enlistments and reserve officers, the total number of men released to the armed forces from these selected occupations by January 1, 1942, amounted to 13,277, or less than two per cent of the number of employees in these occupations. These numbers, of course, constitute only a small fraction of the replacements, owing to separation from service for other causes, which the railroads have had to make during the same period.

Data on requests for occupational deferments of employees in occupations in which the railroads reported existing or anticipated shortages as of February 1, 1942, also indicate that the problem of replacements due to the needs of the army has not as yet been great in the railroad industry. Thus, all Class I line-haul switching and terminal companies reported 10,826 requests for occupational deferment through February 15, 1942, in occupations in which existing or anticipated shortages were indicated. Of these, only 2,055 had been denied as of the same date.

It is, of course, true that the personnel problem occasioned by selective service will become more serious in the future. As has been noted previously, the railroads may expect to lose about 22,000 more men as a result of selective service inductions between April 1 and December 31, 1942. It cannot be emphasized too strongly, however, that occupational deferment only gives employers a breathing-spell period in which they must attempt to locate replacements. Except for one class of persons, there is no such thing as exemption from military service under the Selective Service Act.

It is a great mistake for the railroads or any other employers to think that deferment means exemption. If it proves impossible to replace a key employee, railroad companies may expect to obtain successive deferments extending over a long period of time. These deferments can only be renewed, however, after a reasonable showing by the employer that serious efforts have been made to secure replacements and that these efforts have not been successful. In other words, to secure consideration, as far as occupational deferment is concerned, from local selective service boards, the railroads must demonstrate that they have done everything in their power to make it possible for the employee in question to be relinquished to the military forces. Unless rail-

**Adequate Track Forces Are Necessary to Keep the Railways Running**

road managements realize that this is the situation, there is danger that they will not make the considerable effort necessary to recruit and train new employees and that in consequence local selective service boards may refuse deferments and railroad operations may suffer as a result.

There is no question that essential transportation service must be continued, no matter what the need of the army for manpower. Neither is there any question that some waste is involved when the railroads are required to replace skilled and experienced men with employees of less skill and less experience. Allocation of men between the railroad industry and the army must be based solely on where a given individual can provide the greatest service to the national war effort. That means that there must be proper balance, so far as the railroad industry is concerned, between two fundamental necessities; the necessity of placing a large trained army in the field and the necessity of keeping trained men in transportation jobs. The railroad industry must contribute its share of men to the army up to the point where the war services of the railroads would be crippled if a larger number of experienced employees were released. It cannot be concluded, however, that the war service of the railroad industry will be crippled by the diversion of men to the army until every reasonable effort has been made to locate and train employees who are not primarily available for army duty. Every railroad or industrial company which follows this policy will find that its labor costs may rise somewhat and that peace-time standards of service may suffer. Insofar as the war effort requires such sacrifices by the railroads, they may be expected to accept their share both of sacrifice and of responsibility.

No major railroad can expect to maintain its labor force at the level which the war demands upon rail transportation require and continue the hiring and training methods to which long years of depression and large labor reserves have accustomed them. Not so many months back the processes of hiring for all railroad jobs covered by labor contracts was more or less automatic. Furlough lists were large. A replacement or a new job merely meant recruiting the oldest furloughed man in the craft which required additional men. An employee on furlough was always there waiting to be called. Training was largely unnecessary because large supplies of trained and experienced men existed. Employment offices were unnecessary because it did not require the intervention of a labor recruiting office to bring back the oldest furloughed man on a seniority roster. For most jobs, including those covered by labor contracts, there were usually ten men waiting for every vacancy to be filled. Under these conditions there is little wonder that the training of apprentices almost ceased and that little thought was given to the possibility that the then huge reserve of unemployed workers would ever be exhausted.

How then are the railroads to meet the new manpower situation when reserves of trained and experienced employees are no longer available to them? That they must meet it is clearly evidenced by the importance of transportation in time of war. No matter how obvious, it must be emphasized repeatedly that it is futile to produce the weapons of war if adequate means do not exist to transport them, and that it is impossible to expand war production to the degree which total war requires if transportation facilities are not similarly expanded and the utilization of these facilities improved.

There are three lines of attack which can be made on the railroad manpower problem. In the first place, every avenue of increasing the effectiveness of the existing staff of employees must be explored and every practical means of increasing this effectiveness must be adopted. In the second place, men not now in the industry who have experience in railroad work or in work so closely related that they can be easily adapted to railroad work should be recruited for the industry wherever they are available. In the third place, new employees without railroad experience must be recruited and trained. All of these additional employees, wherever possible, must be individuals who are not primarily needed for the armed forces.

The long period of retrenchment experienced by the railroads since World War I and the serious financial condition in which many railroads found themselves after 1929 are responsible for industrial habits which are wasteful of labor. When large reserves of unemployed but experienced railroad employees were available, there was little motive for railroad managements or railroad unions to adopt measures which would permit

the handling of a larger amount of work by a smaller number of men. The spread-work measures of the depression had in fact just the opposite result. There was an attempt, which the depression made necessary and desirable, to increase the number of employees, even though they could not be employed full time.

Here is an opportunity for meeting part of the problem of manpower shortage which should be grasped immediately. Spread-work devices should be eliminated insofar as possible. Mileage limitations, for example, are neither necessary nor desirable when the unemployment conditions which they were designed to alleviate are no longer in existence. For the duration of the war, mileage limitations should be governed by considerations of health and safety rather than of spreading work. Some railroads are scheduling train and engine service operations along these lines already. Much more could be accomplished and the equivalent of many thousands of additional train-service men added to the railroad labor force.

Shop operations can be regularized to a much greater extent than was true during the depression period. They should be planned, not on a month-to-month basis, but on a year-to-year basis so that the necessity for furloughing men when budget limitations have been reached would be eliminated. Track operations can be scheduled to interfere as little as possible with other demands for labor. This is particularly true in the southwestern part of the United States where in past years the peak demand of railroads for maintenance-of-way labor has tended to coincide with the peak demand of farmers for crop labor.

The possibilities of eliminating waste and inefficiency through union-management co-operation were first explored and developed on the railroads. For that reason the railroads are in a position to utilize the tool of union-management co-operation somewhat more effectively than other industries. Careful planning along this line should be undertaken immediately. Finally, there should be some sort of central clearing house by which measures for saving manpower, found successful on some railroads, could be made known to others.

It is difficult to know how many experienced railroad workers not now employed in the railroad industry could be made available if the proper means for locating and recruiting them were found. The personnel shortage survey referred to earlier in this article showed that many railroads had developed a new source of trained employees by relaxing age limits and physical requirements. A great deal more can be done along these lines where safety considerations permit. Both the Office of Defense Transportation and the Railroad Retirement Board have received many letters from former railroad employees stating that they have been barred from returning to railroad employment because of age limitations. This point is particularly important when the railroads are asking for selective service deferment for men in key occupations. Men between 40 and 65 are unlikely to be called for military service. There is every reason therefore why they should be recalled to railroad work wherever possible.

Many railroads are attempting to discourage their experienced employees who have reached retirement ages from retiring from service under the provisions of the Retirement Act if they are still physically competent to perform their duties. Some railroads have suggested that former employees already retired should be called back to work where their physical condition permits. Since the wages from railroad work are almost always higher than the annuities to which these men may be entitled or had been receiving, there would be no sacrifice of income involved. Men already granted annuities would be returned to the annuity rolls of the Retirement Board immediately when they again left railroad service.

Some of the most serious personnel shortages existing on the railroads are in the mechanical department. A good deal of upgrading has already taken place to meet the problems occasioned by these shortages. Some expansion of apprentice training has occurred but more is necessary. The limitation of the ratio of apprentices to journeymen in labor agreements is not yet an obstacle since railroads generally are employing only half as many apprentices as the agreements permit. If the limitations of the agreements are reached and more apprentices are required, it would appear desirable to modify the agreements. It is to be expected that union representatives will co-operate in making such changes where they are genuinely necessary.

The period of apprenticeship training can and should be shortened substantially. Four years is a peace-time, not a war-time, standard, while good mechanics capable of performing certain important operations can be turned out in less than four years. The speeding up of production means a speeding up of the training process as well.

Short course training methods can also be utilized with good results for occupations both inside and outside the mechanical crafts. Several of the commercial air lines have shown the way in this respect. Training methods of this sort may not have been necessary on the railroads in the past, but they will be in the future if anticipated manpower shortages are even half as serious as it is now expected that they will be.

It is futile, for the most part, to select young men of military age and without dependents, for apprentice or other training. There are, however, many thousands of men in this country who would be available for training and who, as yet, are unlikely to be placed in selective service Class 1-A. The air lines have found that, with a few months training, automobile mechanics can be utilized effectively for airplane maintenance work. If the rubber shortage takes thousands of passenger cars off the roads, there will be a great many men now engaged in automobile maintenance who will be available for transportation and war industries.

One of the most important sources of new recruits for industry in time of war is women. There are approximately 33,000,000 women between 18 and 50 years of age in the United States. Of these, 10,000,000 are now engaged in industry, approximately 1,000,000 in war production work. But there are 11,000,000 or more women in this age group who are not working and who have no small children. If half of this number was utilized, five to six million could be added to the labor supply without drawing either upon mothers with young children or women over 50 years of age.

The transportation industries can call upon this reserve of women power if and when serious shortages develop. At present, a mere 80,000 women are employed in the transportation industry out of a total of more than 2½ million employees. Employment of women in the field of transportation is not an innovation. For many years the clerical staffs in all branches of transportation but railroads has been largely female, and there are many instances in which women have not only occupied highly responsible jobs, but also such humble jobs as crossing flagman and charwoman. In France women have long served as conductors on passenger trains. On at least one railroad in the United States they have been employed as dining car waiters.

During the first World War women replaced men in a wide variety of transportation occupations formerly

**Skilled Craftsmen Are Getting Scarce in Railway Shops**

considered strictly men's work. In both the United States and England, women worked on buses, street cars, subways and on railroads. More than 100,000 women were employed by the railroads alone in the United States when the war ended, as compared with approximately 36,000 who had railroad jobs in 1940.

Since the outbreak of the second World War in September, 1939, women have again been called into transportation service. At present London's buses are run almost exclusively by women. The transport garages are also operated primarily by women. Ten thousand women have taken over most of the jobs on London's subways, except for the actual running of trains. Forty thousand women are replacing railway men called into the armed service, among whom are 250 women acting as porters, with the aid of baggage carts and electric trucks. Women perform almost every kind of transportation work in Russia. In the United States the air lines have taken the lead in the employment of female labor.

Experience has shown that women excel in delicate operations and those requiring precision. They are willing to do monotonous and repetitive jobs and, with the assistance of portable cranes and similar devices, are able to do much heavier work than was possible 25 years ago. In general, women usually learn a new job quickly and their output compares favorably with that of men.

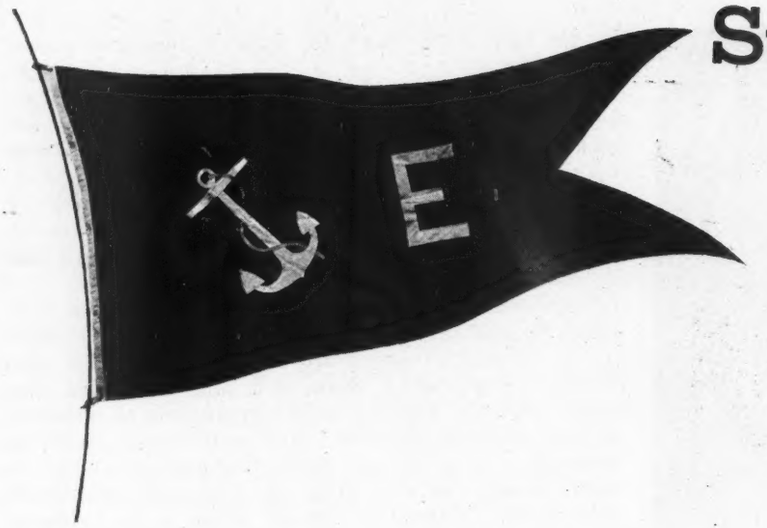
Successful employment of women to replace men hinges largely upon proper training and careful placement. Since few women are experienced in other than clerical transportation work, it is important that they receive intensive training before attempting to introduce them to new types of work. And in all cases it should be remembered that women are individuals like men. A husky woman can do a relatively heavy job successfully and without injury to herself, while a frail woman cannot.

It is difficult, however, for railroad hiring officials, operating independently and on their own, to tap these other sources of manpower. Wide areas of the country must be combed for recruits and this can only be done through an effective employment service. It therefore follows that Federal employment services for the railroad industry should be improved, and must be utilized far more than they have been. This probably means also that railroad hiring must be more centralized than it is at present. In a time of manpower shortage, it is not to be expected that thousands of individual railroad officers and supervisors can, independently of each other, solve their hiring problems.

The necessity of recruiting and training large numbers of new employees suggests that the personnel management methods of the railroads should be revamped to meet this new situation. Railroad officers are prone to regard personnel departments as agencies for the keeping of personnel records, settling grievances, and negotiating labor contracts. In a time of manpower shortages, they can and must become the planners, guiders and administrators of effective personnel policies as to recruiting and training.

The recent establishment of the War Manpower Commission is an impressive indication of the importance which is now being attached to manpower problems. Until recently, the problems of World War II have seemed to center around materials and supplies. In the railroad industry, the expansion of operations due to the needs of the war has been thought of in terms of cars, motive power and materials, rather than in terms of manpower. The time has come, however, when the conservation of manpower has assumed as much importance as the conservation of supplies and equipment. Industrial habits which are appropriate to a period of depression and unemployment must be changed profoundly to meet a situation in which personnel shortages have already developed and more serious ones lie ahead. There is a heavy responsibility upon labor, upon management and upon the government to see that the proper adaptations to the new manpower situation are made. If the necessary changes in personnel policies increase costs, these increased costs should be looked at in the light of the present operating returns and in the light of the needs of the war. If effective utilization of manpower means changes in labor practices which have developed during 10 years of depression, employees likewise should recognize that any such changes which the war effort requires constitute a part of their contribution to final victory.

# Supply Industry




**FOR EXCELLENCE! The Navy "E" burgee Reproduced Above Is Awarded by the Navy to Plants for Production Achievement in Filling Navy Contracts. "E" Is the Traditional Navy Symbol of Excellence. Official U. S. Navy Photograph**

THE railway supply industry was one of the first to accept large orders for war materials, it continues to be one of the major producers of these materials. Its participation in this program has been accelerated during recent months, with the result that at the present time prime and subcontracts booked for its manufacturing facilities aggregate an estimated $5,000,000,000.

Of the more than 9,000 companies which sell to the railroads, the builders of locomotives and cars have taken more contracts for war materials than any other single group of supply companies. According to a recent press report, a survey made by the division of statistics of the War Production Board shows that 16 locomotive and car builders had contracts with the Army, the Navy, the Maritime Commission, and the British Purchasing Commission aggregating $1,436,200,000 on March 1. Of this amount, 5 locomotive builders held contracts totaling $500,900,000 and 11 car builders held contracts aggregating $935,300,000. Numerous other companies hold contracts amounting to as much as $100,000,000 per company. The placing of this large amount of war material with the locomotive and car builders is a natural sequence because their plants lend themselves to the building of heavy war units.

In 1940 and 1941, war materials were produced largely in existing facilities or in idle plants that had been retooled. Later, new plants were constructed and placed in operation. As the war program unfolds, it is anticipated that railway supply companies will participate to even a greater extent, with the result that more of their facilities will be converted or retooled and that more new plants will be constructed.

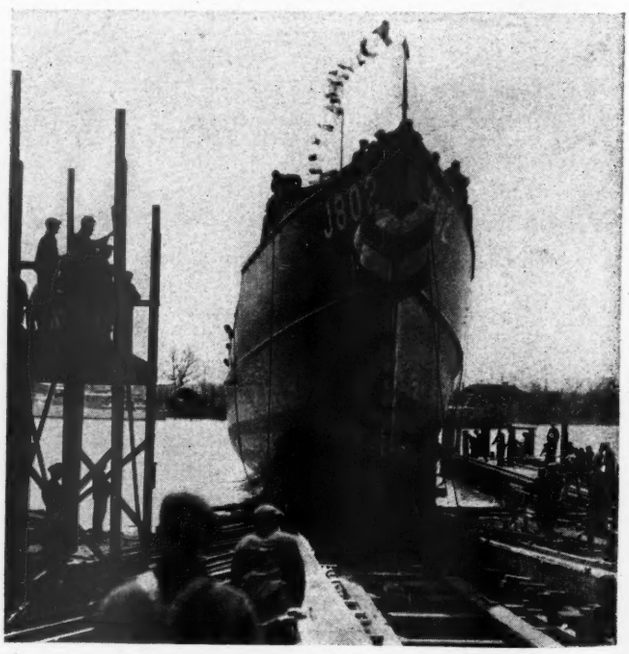
### Production Underway in Record Time

The contribution that these railway supply companies are making to the national war effort represents a colossal achievement in an amazingly brief time. Machinery has been torn down and rebuilt in a conversion from peace to war production. Machines unsuited to the new work have been moved out unceremoniously to make way for others that are adapted to the task. Plants have been

### Conversion to Wartime Activities

**The contribution which railway supply companies are making to the national war effort represents a colossal achievement in an amazingly brief time. The decision to enlist their plants in our war effort was not without foundation, for their facilities and their experience in the fabrication of heavy units for railway operations make their plants especially adaptable to the manufacture of implements of war.**

**The speed and facility with which railway supply companies have converted their plants, and, in record time, turned out products that are foreign to their normal production, is a testimonial to their industrial engineering acumen. Many of their plants are turning out materials months ahead of schedule. So excellent have been the achievements of railway supply companies that recognition has been received from the government, the Army and the Navy.**



**SHIPS. Boats, Minesweepers, and Sub Chasers Are Being Built by Car Builders. Photo Courtesy American Car & Foundry Co. which Launched Its Second Minesweeper on April 2, 1942, when It Was Awarded the Navy "E" Pennant**

# Takes on Much War Production

## Constructs many new plants and converts old ones to war time production in record time

remodeled, idle ones restored to life. New buildings have risen.

The speed and facility with which these railway supply companies have converted their plants, and, in record time, turned out products that are foreign to their normal production, is a testimonial to their industrial engineering acumen. When the first orders for war material appeared in 1939, the railway supply companies accepted them in stride along with their normal business. As the lend-lease program was accelerated, these orders became larger and the retooling of idle plants was undertaken and accomplished in whirlwind fashion.

The Pullman-Standard Car Manufacturing Company, for example, received an oral order on September 5, 1940, and after securing machinery and personnel for an idle plant at Hammond, Ind., produced its first combat tank late in May, 1941. The Butler, Pa., plant of this company began with a bare floor on August, 1940, and on November 7 shells began to roll off the line. Similarly, the American Car & Foundry Co. turned out its first combat tank in May, 1940, only six months after it had received an order; by August 2, 1941, it had completed its 1,000th and in November, its 2,000th tank.

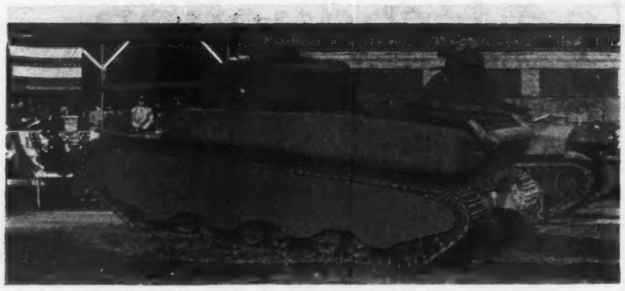
The American Locomotive Company likewise began the assembly of combat tanks and gun carriages, soon after orders were received and on April 19, 1941, it made first delivery on a tank order which it had received on November 23, 1940; likewise, on May 19, 1941, this company delivered the first gun carriages on an order which had been received on August 8, 1940. Indicative of the rapidity with which these companies are increasing production, the American Locomotive Company delivered war materials during the first quarter of 1942, equaling its total ordnance shipments during the entire 12 months of 1941. Within a few weeks this output will be still further increased substantially.

The United States Steel Corporation subsidiary, the Federal Ship Building & Dry Dock Co., is another company that has established a record for volume and speed of construction. As of May 4, 13 ships had been launched at this shipyard in 1942; nine have been delivered and keels have been laid for several others. On April 28 this company delivered a destroyer to the Navy five months ahead of the contract delivery date. On May 3, the Federal Company established a new world's launching record when four destroyers closely followed one another down the ways into the water, all approximately 90 per cent completed.

### Receive Recognition

So perfected are the methods and the workmanship of many of these railway supply companies that they are so far ahead of their schedules as to draw attention and acclaim from the government, the Army and the Navy. Official recognition of the production achievements of railway supply companies is indicated in the large number of Navy "E" burgees awarded railway supply company plants by the United States Navy for distinguished service and excellence in the production of ordnance material on Navy contracts. Among the plants to receive this award are those of the Ardco Manufacturing Company at North Bergen, N. J., on March 26; the Electric Storage Battery Company at Philadelphia, Pa., on March 28; the American Car & Foundry Co. at Wilmington, Del., on April 2; the Auto-

**GUNS. This 105 mm. Howitzer Carriage Was Made, Personally Autographed and Paid for by Employees of the Pullman-Standard Car Manufacturing Company. It Was Presented to the Army on Army Day**



**TANKS. 60-ton Combat Tanks Are Being Produced by the Locomotive Companies. Photo Courtesy Baldwin Locomotive Works which Delivered Its First Tank, Shown Above, on December 8, 1941**

matic Transportation Company, on May 2; and the Nordberg Manufacturing Company at Milwaukee, Wis., on May 15.

The South Chicago, Ill., works of the Carnegie-Illinois Steel Corporation has received from Robert P. Patterson, undersecretary of war, a telegram congratulating the employees for breaking records in steel production during March. This corporation, during 1941, established 157 new production records in its operations. These included new high marks by 22 of its 57 blast furnaces, by 16 of its 25 steel-producing departments, and by 46 out of 92 primary and finishing mills, as well as 73 all-time records in plants producing molds, wheels, axles, armor forgings and castings. The Chicago area plants of the Carnegie-Illinois Steel Corporation broke 19 of their monthly production records during March, including 12 at the South Chicago Works, 5 at the Gary Works and 2 district records for production.

**SHELLS Are Being Manufactured by Several Railway Supply Companies. Photo Courtesy American Car & Foundry Co.**

The American Locomotive Company is also ahead of production schedules. On April 20, Duncan W. Fraser, president, announced that since the completion of the company's first tank, total deliveries are several times the number of tanks called for by the original contract and that present deliveries are now several times greater than contract obligations. On the following day Robert T. Patterson, undersecretary of war, telegraphed the 7,000 employees at the Schenectady plant of the company, congratulating them for going 130 per cent ahead of schedule in a single year. The production of fragmentation bombs, Diesel engines for the Navy, shells and other items are also ahead of schedule.

The Midvale Company and the Standard Steel Works division of the Baldwin Locomotive Works have been likewise honored by the award of the flag of the Bureau of Ordnance of the United States Navy, together with the Navy "E" pennant.

### Spirit of Workers Behind Records

Behind the production records run up by the railway supply industry, is the patriotism and determination of their workers. Typical of employee spirit is that of the workers at one of the plants of the Pullman-Standard Car Manufacturing Company. Surpassing production schedules was not enough for these workers so they decided to buy the "X" thousandth howitzer carriage and the "X" thousandth trench mortar which they would soon produce and present them to the Army. The weapons, specially painted red, white and blue and bearing the die-stamped names of the workers, were dedicated "to General Douglas MacArthur and his gallant Philippine army" and presented on Army Day, April 6. In addition to "chipping in" for these weapons, these employees purchased war bonds totaling $12,000 during March.

Employees and management of the Johns-Manville Corporation have organized a country-wide war production drive in the company's 17 factories and mines throughout the United States, in line with the recent appeal of Donald M. Nelson, chairman of the War Production Board, for increased war production. Central committees, composed of management and employees, have been appointed at each plant and mine to lead the drive and all-out-for-war-production rallies were held in April.

The gigantic role which the railway supply companies

**SEARCHLIGHTS For the Detection of Aircraft Are Made by the General Electric Company. Each Is 60 in. in Diameter and of 800 Million Candlepower**

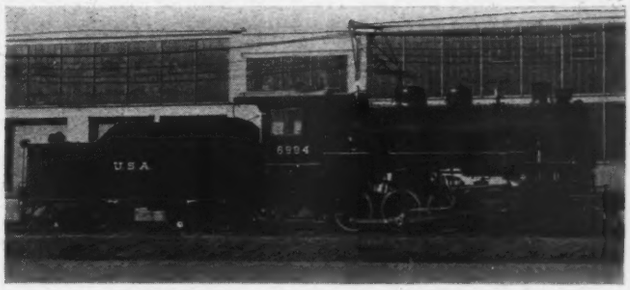
have thus far played in the war, is becoming even more important by reason of accelerated production, the conversion of more facilities and the construction of new plants. In February, it was announced that the United States Navy will spend $15,600,000 for buildings and equipment that will make it possible for the Beloit Works of Fairbanks, Morse & Co. to sextuple its present output of Diesel engines and auxiliary equipment for the Navy in the next 18 months. The amount includes $6,800,000 previously allocated.

The General American Transportation Corporation has recently added to its facilities a complete shell-making plant and is now delivering shells completely forged and machined. It is expected that within a very short time the company will also be producing other types of important munitions. In addition, plans are being made for the extension of facilities so that large quantities of armor plate tank hulls can be welded.

The Pacific Car & Foundry Company has turned to boat-building and in March launched a 250-ton Navy vessel. The Pullman-Standard Car Manufacturing Company and the Navy have completed arrangements for the erection of shipbuilding facilities at the south end of Lake Calumet (Chicago), Ill., under a contract that calls for the construction of 50 steel submarine chasers after the plant is constructed.

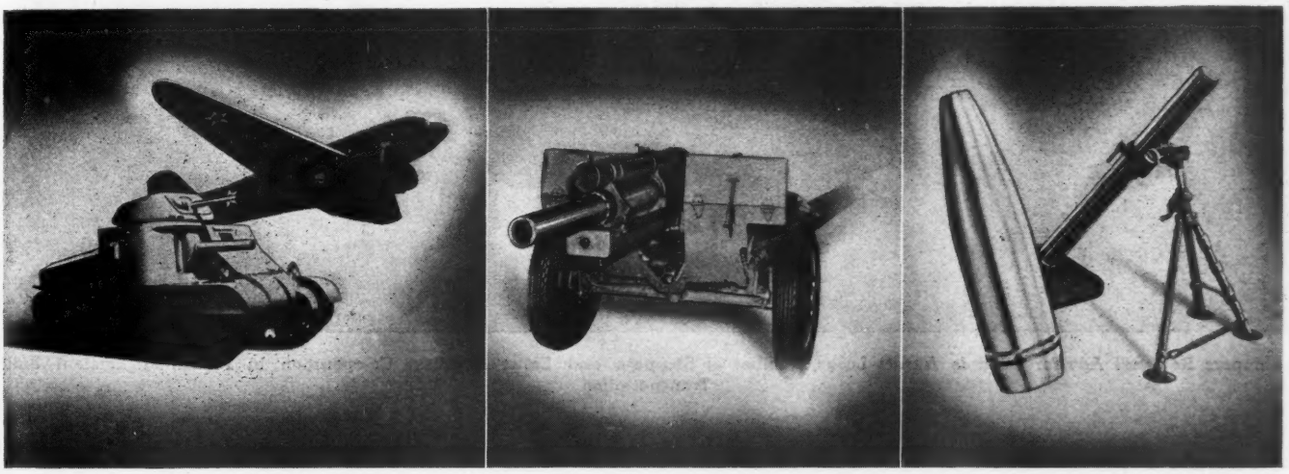
By means of streamlined production methods which call for the fabrication of large sections of the ships in the company's car shop, with final assembly on the ways, the yard is expected ultimately to turn out a ship a week. According to C. A. Liddle, president of Pullman-Standard, one of the reasons the contract was awarded Pullman-Standard, was the company's long experience in working heavy steel. While there are many plants on the Great Lakes that can build 110-ft. wooden submarine patrol boats, the Navy encountered difficulty in finding manufacturers with sufficient steel working experience to turn out the larger newly-designed subchasers.

Construction involving $45,000,000 of its own funds and $50,000,000 of government funds is planned by the Union Carbide and Carbon Corporation for 1942. This compares with an expenditure for construction of $59,500,000 of its own funds in 1941. The Baldwin Locomotive Works made substantial improvements in its physical property in 1941, largely as the result of the installation of new machine tools and other up-to-date mechanical devices. Substantial shipments of ordnance orders have been made, according to the annual report of the company, but the facilities have by no means reached the volume of which they shall be capable.




**LOCOMOTIVES and Their Parts Are Being Manufactured by the Locomotive Builders and Accessory Companies. This 280 Locomotive, Weighing 153 Tons, Was Turned Out in March, 1942, for the U. S. Army by the Lima Locomotive Works, Inc. Photo by U. S. Army Signal Corps**

In addition to two ordnance plants which the Westinghouse Electric & Manufacturing Company is operating for the Navy, it is constructing three plants under lease agreement with the Defense Plant Corporation, for the production of turbines and gears for the merchant marine and radio tubes and other products. The Allegheny Ludlum Steel Corporation spent approximately $3,400,000 for plant additions and betterments in 1941. In addition to these expenditures a lease agreement has been entered into with the Defense Plant Corporation whereby Ludlum will build a plant for the Defense Corporation at an estimated cost of $4,650,000 and operate it under lease for production of war materials.



**Airplane Wings, Combat Tanks, Howitzer Carriages, Shells and Trench Mortars Represent the Diversity of War Products Being Turned Out By the Pullman-Standard Car Manufacturing Company**

The Electro-Motive Division of General Motors Corporation, in an effort to increase the production of Diesel engines for the Navy, is speeding the construction of a major addition to its LaGrange, Ill., plant. The addition will add about 250,000 sq. ft. to the present main building and will probably be in operation by the first of November.

Although many new plants have been erected, the larger portion of the war materials produced by the railway supply companies thus far has been handled in existing plants. Almost every railway supply company which has manufacturing facilities that are adaptable to the production of items of war is now working on war contracts. Many of these companies have not yet reached the limit of their ability to produce war products and will soon increase their output several fold.

**Shippers Regional Advisory Boards Attract Large Number of Shippers and Enlist Heartiest Co-operation in Promoting Efficient Rail Transportation**

# What the Shippers Are Doing

## Co-operation between the carriers and their customers is playing a vital part in solving transportation problems

EFFICIENT car handling and utilization are primarily problems for the railways to solve; nevertheless no matter how efficient they may become, they cannot obtain the maximum results without the co-operation of the shippers and receivers. This naturally follows because, in the normal course of operations, the railway freight car is out of the hands of the railways and in the control of shippers and receivers for a substantial portion of the time. *Today, the railways are getting such co-operation from the shippers.* There is no parallel in modern business for the relationship that now exists between the railways and their shippers.

Several factors are responsible for this. The country's railway traffic executives and their associates have completely revised the approach that was prevalent up to the last war. Instead of taking an interest only in the amount of tonnage a shipper can give them, they now study the shipper's transportation problems. Equally important is the fact that for several years railway operating and transportation officers have come into contact with their railway's customers in a manner that was entirely unknown 20 years ago, and this has resulted to their mutual benefits. Such organizations as the shippers advisory boards and the National Industrial Traffic League have been outstanding in bringing about this mutual understanding, which was laid on a foundation of many years' experience, and which is proving invaluable under today's emergency conditions.

## The Advisory Boards

More than 13,000 shippers are represented in the 13 regional shippers advisory boards which have behind them a record of 18 years of smooth working and efficient functioning. As a result, when the present emergency arose, they were at hand, ready with this

## Partners for Victory

**There is no parallel in modern business for the relationship that now exists between the railways and their shippers.**

**More than 13,000 shippers in 13 regional advisory boards have for 18 years been co-operating in improving railway efficiency.**

**351 vigilance committees, comprising 2,858 shippers, are now policing industries in 464 cities to eliminate abuse of transportation facilities.**

**The National Industrial Traffic League is also extending "all out" co-operation to transportation agencies in behalf of shippers.**

**I. C. C. Commissioner Johnson's informal meetings with shippers are ironing out many rough spots in transportation practices.**

**Perfect Shipping Month—a joint activity of shippers and carriers—is doubly important now in preventing damage to vital materials in transit.**

**This shipper-carrier co-operation will continue—it must continue for the successful solution of our wartime transportation problems.**

experience, to aid in the efficient functioning of our transportation system. One of their first actions was to campaign vigorously for heavier loading as a means to conserve the available supply of freight cars. Prompt and proper handling of cars while under shippers' control was another factor on which much stress was laid and is being laid.

During the years of plentiful car supply, certain abuses in car supply and car handling had crept in which were undesirable, though perhaps excusable under the conditions then prevailing, but which, in time of war, are completely inexcusable. To correct these abuses and to acquaint every shipper in the country with the vital need for efficient car utilization, so-called "vigilance" committees have been formed by the shippers themselves to co-operate closely with the railways and representatives of the bureau of service of the Interstate Commerce Commission in stamping out these practices.

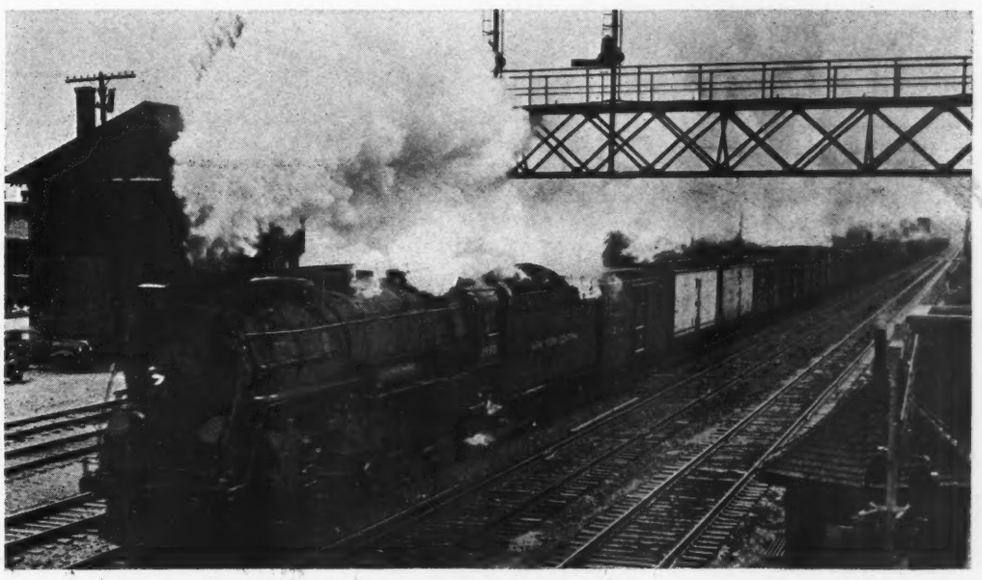
Under the direction of the advisory boards, 351 of these vigilance committees are now functioning in 464 cities, with a total membership of 2,858 shippers and receivers, for the purpose of supervising car handling on the part of shippers and receivers, while approximately 30 additional committees are in the process of organization. These committees are taking an active and continuing interest in reducing the time required to load and unload cars by shippers and receivers. In all cases where cars are being delayed at industries awaiting unloading, these committees take immediate corrective action with the company involved; and they report that their activities are being received by these companies in a spirit of co-operation and a willingness to accept suggestions. The committees have also been markedly successful in reducing the number of cars returned to the railways containing dunnage and other refuse, thus eliminating delays that would otherwise occur in sending such cars to cleaning tracks. Specifically, the results are shown in the reduction in the number of firms delaying cars in excess of 48 hrs. In a consolidated report for the week ending March 13, 1942, it was shown that 41.8 per cent of the cars on hand at these plants were held in excess of 48 hrs., whereas for the most recent week that statistics are available, only 35 percent of the cars on hand were held in excess of 48 hours.

### Cutting Down Dead Time

The accomplishments of these committees have been extremely helpful in saving cars, as indicated by a few examples selected from the thousands of cases handled in the last few months:

Coal company, Illinois—Of 24 cars on track awaiting unloading, 20 had been delayed 48 hr. or longer. The committee acted and during the following week all cars were released within 48 hr.

Warehouse company, Illinois—Of 18 cars awaiting unloading, 10 had been delayed over 48 hr,; 1 for 5 days. The average daily releases were 5 cars. The



**Unloading Cars Promptly Saves Many Car Days**

committee acted and, for the following week, only 4 of 13 cars were held over 48 hr. and the unloadings had been increased to an average of 6 cars daily.

Merchandise company, Illinois—Of 9 cars held, 7 had been delayed over 48 hr., 1 for 8 days. The committee acted and during the following week only 4 cars were on hand for unloading, of which only 2 had been held over 48 hr.

Merchandise company, Nebraska—Of 12 cars held, 10 cars had been held in excess of 48 hr. The committee acted and the next week there were no cars on the track longer than 48 hr.

Paper company, Maine—Of 195 cars on hand, 76 had been held over 48 hr.; 1 for 13 days. The committee acted and the following week cars on hand were reduced to 107, of which only 10 were held over 48 hr.

Brewing company, Rhode Island—This company had persistently delayed cars for many years, with an average of 5 to 7 cars held, 4 to 5 of which were on demurrage. After the committee acted, the company acquired 3 additional warehouses, purchased a conveyor truck and employed additional labor to unload cars, with the result that reports for the last several weeks show that cars are now being unloaded currently.

Firearms company, Connecticut—23 cars showed an average delay of 4.3 days per car, with 4 cars held 10 days each. The committee acted, and unloading crews were worked over the week-end, with the result that only 3 cars were on the track the following Monday, only 1 of which had been held as long as 24 hr.

selves with many other important matters as well. The examples given below are from the records of the central vigilance committee in the Midwest Board territory, but similar examples might be cited from all regions:

Shippers reported difficulty in getting 50-ft. cars necessary to move certain traffic. The committee met with railway representatives and a plan was worked out by which car requirements were submitted to the carriers as far in advance as possible, thus enabling them to meet the shippers' demands. The railways also have arranged to keep 50-ft. cars on hand for emergency loading.

A check of delays in unloading grain cars showed a lack of proper switching. The committee and railway representatives conferred with the yardmasters involved and a modification of switching service was made that resulted in an average increase in unloading of two cars daily. Meanwhile, the companies involved increased their working days from five to seven a week, unloading more cars weekly.

Under a government requirement, samples to be taken from starch shipments delayed cars four or five days in unloading. The committee secured from government officers approval of the tests by telegram, thus saving two days on each car.

### Loading and Unloading Speeded

Individual shippers have investigated their own methods of loading and unloading and have achieved excellent results, examples of which follow:

By a complete reorganization of its unloading schedule, a midwestern steel mill cut the number of cars held more than 48 hr. from 680 during November, 1941, to 82 in March, 1942, a decrease of 87.9 per cent.

A consolidated report from the eight branches of a food distributing company shows that of 412 cars unloaded during a recent week, only one was held over 48 hr., while 129 were unloaded immediately upon arrival, 191 within the first 24 hr., and 91 within the second 24-hr. period.

A petroleum products manufacturer has revised his loading and unloading program with good effect. As soon as space is made by the unloading of inbound empty drums and cans, loading of the same car is begun. Thus cars are now unloaded and reloaded on the same day.

A linoleum manufacturer has adopted the slogan:

**Cars Amounting to Many Trainloads Daily Are Saved by Heavier Loading**

Merchandise company, Massachusettes—Of 7 cars on the track, 5 were on demurrage, the release averaging only 1 car per day. The committee requested that unloading forces be worked over the week-end and the accumulation was completely cleaned up.

Paper company, Massachusetts—Of 14 cars on the track, 5 were on demurrage. The committee asked that unloading crews be worked over the week-end and the accumulation was cleaned up by Monday morning.

Storage battery company, Pennsylvania—This company had an accumulation of 22 cars awaiting unloading, of which 1 had been held 14 days. The committee acted and the accumulation was entirely cleaned up.

The vigilance committees serve not only to police inefficient methods of unloading cars, but concern them-

"Billions for defense, but not one cent for demurrage." This company, which paid $4,200 in demurrage during May, 1941, recently completed a four-month period during which demurrage was paid on only two cars of the total of 5,251 cars loaded and unloaded during the period. Another shipper of linoleum and floor coverings revised his loading methods and, in a few months, increased the average loading per car from 45,000 lb. to 75,000 lb., or 66.6 per cent. Previously the cars had not been loaded more heavily because, among other things, damage to the loading was feared. A careful check of the heavily-loaded cars at destination showed no increased damage.

The glass industry has been particularly co-operative. One company increased its loading three tons per car by arranging for pool shipments. Another rearranged loading schedules to save 50 cars per month. Still another company, which formerly loaded two minimum cars from two adjacent plants now loads tonnage from both plants in one maximum car, saving 300 cars yearly. Still another glass company has changed its buying from a ton to a car basis. Salt cake, for example, that formerly moved in 30-ton lots, is now shipped in hopper cars loaded to capacity.

A coal company has advised those of its customers who send in orders for minimum weight cars that such orders are accepted subject to delay, which has materially reduced such orders. Another large coal company stamps all sales acknowledgments: "Please do not send us orders for minimum weight cars." A shipper of cleansing compounds has increased average loading from 36,000 lb. to 60,000 lb. per car.

The fir lumber industry of the Pacific Northwest, as represented by 79 mills, has materially increased average loadings. In 1940, the average load per car was 57,605 lb. This was increased 3.4 per cent to 59,559 lb. in 1940, and, so far this year, the average has been 63,904 lb. In 1941, the increased load represented a saving of 2,492 cars, and this will be much greater in 1942.

## Other Shipper Activities

In addition to these and many other instances of co-operation in individual cases, the shippers have been active in promoting more general policies for the welfare of transportation. The National Industrial Traffic League is extending "all-out" co-operation, one evidence of which is the creation of a special committee on emergency transportation to work closely with the Interstate Commerce Commission, the Office of Defense Transportation, the War Shipping Administration and other government and transportation agencies whose activities control or affect transportation.

Committees have been appointed by several shippers boards in different regions to study sales practices with a view to suggesting to the railways where the carload minimums may be increased. This voluntary action of the basic industries enables the railways to place the minimums in effect promptly, without the necessity of formal hearings.

The informal gatherings of shippers under the direction of Commissioner J. M. Johnson of the Interstate Commerce Commission have been particularly helpful. At these meetings, the shippers in a particular industry are called together for a frank discussion of their transportation problems and the ironing out of undesirable practices. The commissioner, who is in charge of the I. C. C. service bureau, has the power to issue orders, but prefers to handle the situation through mutual co-operation rather than force. The results so far have vindicated his policy in this regard.

The proceedings at these meetings are detailed and specific. At one attended by leaders of the bituminous coal industry, for example, the following subjects, among others, were discussed thoroughly: Tidewater detention, free time at ports, reduction in classifications, pooling of consignments, exchanging cargoes, excessive detention, waste of cars at mines, possibilities of conservation and centralized authority. The effect of these meetings has invariably been better car handling in the industry involved.

Further joint action in which an entire industry is involved is carried out every year during the wheat movement. The grain trade, the large shippers, the elevator men and others concerned in this movement have already held a series of joint meetings, which have resulted in the certainty that freight cars will not be used for storage purposes this year so far as wheat loading is concerned. In view of the almost complete glutting of storage space with the carry-overs from the 1940 and 1941 crops, it is unlikely that much wheat will be transported direct from the harvest fields this year. However, unless these joint meetings had been held and the realities of the situation faced, the western railroads might well have found their terminals blocked by thousands of cars of wheat with no place to go. The joint meetings have insured that no such grave threat to national war production will happen.

## Perfect Shipping Month

One of the carrier-customer joint efforts that has been in effect for some years is the "Perfect Shipping Month." This device, always valuable, has taken on a new importance in the present emergency. W. J. Williamson, formerly general traffic manager of Sears, Roebuck & Company, and now head of the traffic control office of the war department, served as general chairman of the national management committee directing the campaign. He expressed the purposes of the 1942 Perfect Shipping Month as follows: "The shippers and carriers of this country have resolved to hold loss and damage to freight and express down to the minimum. They are not thinking merely in terms of economic waste, although the loss and damage bill for 1941 approximated 23 million dollars. Our principal objective is to avoid a loss of time, which can be a critical matter right now. Damage to essential equipment or machinery while enroute may require replacement and that may mean serious delay. In individual cases, this lost motion can cripple an important war effort. Perfect Shipping Month symbolizes the determination of all of us to keep the transportation channels of the country free from shipping failures resulting from inadequate packing of goods, or careless handling."

Some 25,000 shippers in all sections of the United States participated in the Perfect Shipping Month, which was endorsed by many outstanding men, including Joseph B. Eastman, director, Office of Defense Transportation, and Donald M. Nelson, chairman of the War Production Board. Using the experience of past years to good advantage, April, 1942, approached closer to a Perfect Shipping month, relatively, than any previous one.

### All Must Participate

Without attempting to argue the rights or wrongs of the rigid allotment of railway equipment by the W.P.B., there is one fact that is indisputable. This order makes it more imperative than ever that equipment be con-

served and not misused. The shippers, the railways and, in general, the railway employees, have been doing a wonderful job, but they will have to do better. Above all, certain abuses must be eliminated. The worst offenders are that class of merchants who buy and sell from railway cars. For years these people have found it cheaper and more convenient to pay demurrage on freight cars than to pay rent for storage space. When approached by the vigilance committees to release cars faster, too many of this class of dealers have flatly refused to co-operate. Whatever the justification for such practices in peacetime, there is no justification for them now. They should be eradicated from the transportation picture.

The railways, too, must not forget they have a duty to perform. No shipper cares to go to trouble and expense to save cars and see inefficient railway operations nullify the effect. Railway employees, particularly switchmen, also have a direct responsibility. They can, and in some cases do, nullify the best efforts of the shippers and the railway managements by insistence that their "rights and privileges" not be disturbed, even by the exigencies of wartime. Most railway employees are co-operating wholeheartedly in an effort to provide the necessary transportation to win the war, but not all of them. The railway managements should also see that the vigilance committees receive complete co-operation. Some of these committees complain that they are experiencing difficulty in getting reports on cars at certain stations. This condition should not be allowed to continue.

Even with the above exceptions we are able to present a picture of the vast majority of shippers, railway officers and railway employees in a joint co-operative effort that is without parallel in industry. This is the sort of co-operation that will keep the country's transportation system from breaking down, if the railways are permitted to obtain what they need to keep going under the unprecedented traffic of today.

## Materials Vital to Sustained Railway Effort

(*Continued from page 1026*)

first—in transportation, as in everything else. When it becomes necessary to divert materials from transportation in order to insure an uninterrupted flow of war production, that necessity can be appreciated and will be accepted by all concerned. Then it becomes our duty, as patriotic citizens, to face the situation ahead of us and alter our plans accordingly.

"It means that all of us engaged in railway transportation—shippers and travelers and railroaders alike—have got a harder job to do with fewer and less adequate tools than we had anticipated. That's our challenge. Our answer is that we'll buckle down and do our very utmost to meet the requirements.

"The job is simply harder, not impossible. We on the Illinois Central are resolved there will be no failure here for lack of trying."

In contrast with the situation confronting the railroads in the last war, moreover, carriers entered the present emergency with well-organized supply departments which have systematically worked together through the Purchases and Stores Division, A. A. R., in promulgating uniform methods, records and standards which have simplified the present supply problem.

ODT (Office of Defense Transportation) has a division of materials with a consulting staff of recognized experts in the field of railway purchases and manufacture to study the needs of the railroads in their broader aspects, and the importance of materials to railroads has a vigorous exponent in Joseph B. Eastman, director of ODT, who has emphasized needs of the railroads in public utterances and in appearances before war agencies.

Speaking in Washington, D. C., on January 27, Mr. Eastman said, "To achieve the best results in the war effort, a proper balance must be kept between war production and transportation. In the end it will do no good, and it may do much harm, to distribute supplies of critical materials as between production and transportation in a way which will impair the effective functioning of transportation as an essential part of the defense mechanism. Nor will it do any good, even if the functioning of the defense plants is not thereby at once impaired, to produce implements and munitions of war too far beyond the capacity of transportation facilities to carry them to the theatres of action, and thus to aggravate and unduly extend the storage problem."

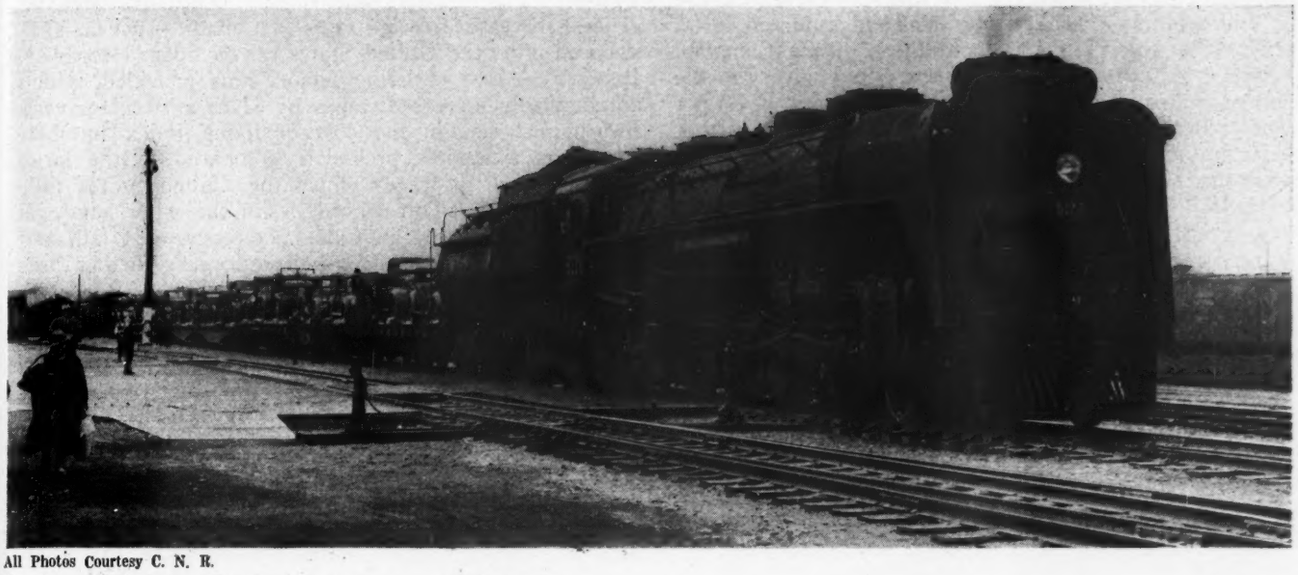
Again in Chicago on February 5 and in Boston, Mass., on February 12, he said, "The situation with respect to materials and equipment constitutes the No. 1 problem of the Office of Defense Transportation. If the carriers are to continue to function effectively and well, they must have the materials necessary to keep their equipment and facilities in good working order, they must be able to replace worn-out equipment and they must have whatever new equipment and facilities that may be necessary to meet the demands of an increasing traffic."

Again in speaking before the Chamber of Commerce of the United States in Chicago on April 29, the Director of ODT said, "The War Production Board has the extraordinarily difficult task of determining how our limited stocks of critical war materials, like steel, shall be parcelled out among demands which are much larger in the aggregate and which are all of vital importance to the war effort. I am pleading the cause of transportation before that Board to the full extent of my ability."

### WPB Increases Railway Department

In WPB the main job is to produce the materials and machinery of war. Interest in civilian supply, for the most part, is that of keeping them from interfering with military supplies, keeping essential civilian industries going and distributing residual supplies in a way that will be least harmful and most beneficial. In this department, hundreds of people engage in a multiplicity of occupations and the railroads must compete for a division of the available supplies with other consumers, large and small, whose pleas are no less ardent than those of railroads. Also, to an increasing degree, WPB, in setting up quotas of materials for railroads, inquires into the relative importance of different classes of railway work and the efficiency which both equipment and traffic are handled. While WPB is not pre-occupied with railroads and railway problems or always completely in accord with railway viewpoints, it recognizes a responsibility in keeping the railroads running and now has an organization of almost 200 employees and consultants engaged entirely with transportation problems. Employees of several railroads and railway manufacturers hold key stations in this branch and the department is now equipped, according to its chief, to follow railway material problems from beginning to end to assure that railroads and railway manufacturers obtain all the materials to which they are entitled.

Special statements to *Railway Age* in which Joseph L. Weiner and Andrew Stevenson discuss the railway material situation from the standpoint of WPB appear in boxes in this article.



All Photos Courtesy C. N. R.

**Ready to Give Some War Freight a Quick and Careful Ride**

# The Railways and the War Effort, Synonymous Terms in Canada

## Dominion carriers have a job quite similar to that of U. S. lines, and they are doing it successfully

THE Canadian railways are an integral part of the single network of steel which acts in unison in the service of the whole North American continent. The role in the war effort of this great unified transportation system is therefore, not a thing apart from that of the other separate railway companies, which combine to form this interconnected continental system. The Dominion, it is true, became an active belligerent some two years ahead of the Republic to the south of the frontier—but that simply meant a somewhat more intensive development somewhat sooner, in the Dominion than in the States.

The Canadian railways, just as those south of the international boundary, faced the traffic load of a period of hostilities, incurring great increases in industrial production, after a prolonged period of low traffic and miserable earnings. An accompanying table sets forth the revenue tons and the revenue ton-miles of the two principal Canadian systems over the past fourteen years, compared with those of the combined railroad systems of the United States; and, to facilitate comparison, the ton-miles have been shown also in percentages of 1928 (which was Canada's year of heaviest traffic). It will be noted that ton-miles of both the large Canadian railways declined, in 1933, to 51 per cent of the 1928 level, whereas the decline in the States was slightly less—namely, to 54 per cent of the 1928 level.

### Canada's Railway Story Parallels That of U. S.

By 1940, however—indicating that actually being in a war puts a heavier load on transportation than do de-

**Freight Service Performance, Canadian and U. S. Lines Compared**

| Year | Canadian Pacific | | | Canadian National | | | U. S. Class I Railroads | |
|---|---|---|---|---|---|---|---|---|
| | Revenue Freight Carried (000 Tons) | Revenue Ton-Miles (000,000) | % Ton-Miles of 1928 | Revenue Freight Carried (000 Tons) | Revenue Ton-Miles (000,000) | % Ton-Miles of 1928 | Revenue Ton-Miles (000,000) | % Ton-Miles of 1928 |
| 1928 | 42,977 | 18,423 | 100 | 69,155 | 22,588 | 100 | 432,915 | 100 |
| 1929 | 40,977 | 14,951 | 81 | 65,213 | 19,375 | 86 | 447,322 | 103 |
| 1930 | 33,733 | 12,370 | 67 | 54,563 | 16,910 | 75 | 383,450 | 89 |
| 1931 | 27,187 | 10,793 | 59 | 41,708 | 14,610 | 65 | 309,225 | 71 |
| 1932 | 22,613 | 10,067 | 55 | 34,377 | 12,818 | 57 | 233,977 | 54 |
| 1933 | 22,020 | 9,353 | 51 | 31,368 | 11,550 | 51 | 249,223 | 58 |
| 1934 | 25,606 | 10,026 | 54 | 36,966 | 12,950 | 57 | 268,711 | 62 |
| 1935 | 26,094 | 10,522 | 57 | 38,808 | 13,509 | 60 | 282,037 | 65 |
| 1936 | 27,985 | 11,424 | 62 | 43,451 | 14,814 | 66 | 339,246 | 78 |
| 1937 | 29,843 | 11,602 | 63 | 47,038 | 15,165 | 67 | 360,620 | 83 |
| 1938 | 30,471 | 12,135 | 66 | 40,578 | 14,505 | 64 | 290,084 | 67 |
| 1939 | 33,030 | 14,037 | 76 | 45,691 | 17,084 | 76 | 333,438 | 77 |
| 1940 | 36,746 | 16,028 | 87 | 55,060 | 21,532 | 95 | 373,253 | 86 |
| 1941 | 44,710 | 22,376 | 121 | 65,370 | 27,200 | 120 | 475,054 | 110 |

fense preparations alone, be they ever so energetic—the ton-miles of the Canadian National had mounted to 95 per cent of the 1928 level, and those of the Canadian Pacific to 87 per cent, while the ton-mile recovery of the United States railroads rose to the lower ratio of 86 per cent of 1928. By 1941, the Dominion had really hit her stride in industrial production and the Canadian railways exceeded, in ton-miles, 120 per cent of the 1928 level, while the United States lines' 1941 ton-miles went to only 110 per cent of the 1928 total.

### No Sign of Let-Up in Traffic Increase

The carloadings figures for 1942 (ton-mile statistics being slower to compile and, hence, not being available for recent months) do not indicate any tendency on the part of production and traffic in the Dominion to "level off." Indeed, Canada's carloadings for the first 18 weeks of the current year were 12 per cent above the same 1941 period—whereas the increase south of the international boundary was slightly less, namely, 11 per cent. On the other hand, however, General Order No. 1 of the Office of Defense Transportation placed the United States railways under necessity of shifting their handling of less-than-carload traffic considerably, effective May 1, and they began to prepare for this shift in advance of the "dead line"—with a result that, south of the boundary, a great decline in l. c. l. carloadings was shown, a condition which did not obtain in Canada.

It would not be surprising, therefore, when figures of tons and ton-miles are available for the first third of the current year, to discover that actual traffic handled by the U. S. lines increased somewhat more in that period than was the case in the Dominion. Be that as it may, the relative pressure of traffic on the railways of the Dominion would appear so far to be both somewhat heavier, and it certainly occurred somewhat earlier, than on the railways further south, taking the latter as a whole.

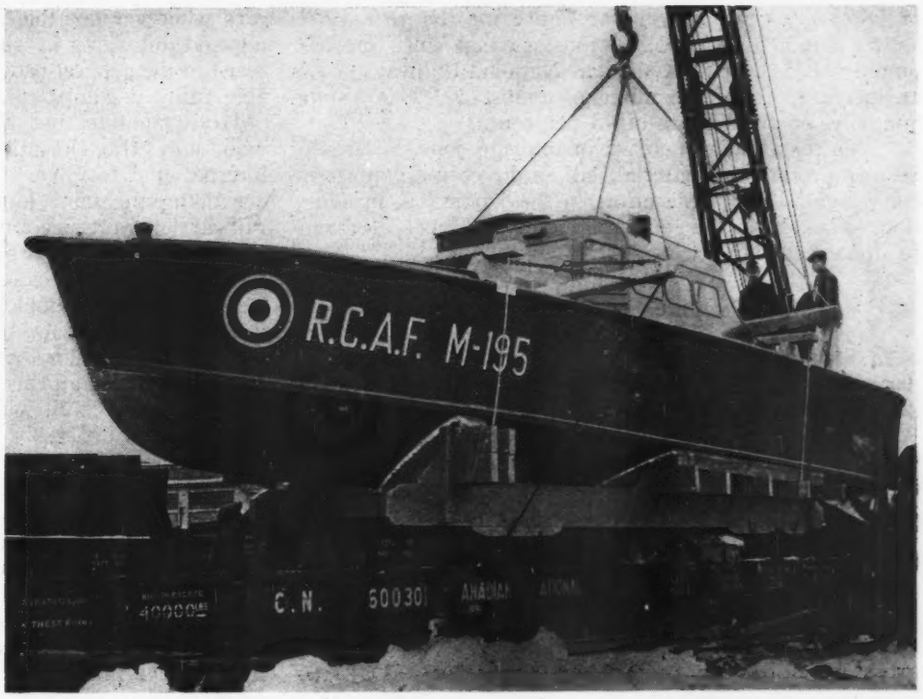
In two very important respects, however, the Dominion has approached its war transportation problem in a considerably different manner from her sister Commonwealth—namely, *wages* and *rates*. There has been no general increase in wage rates in Canada—such as that imposed upon the United States railways last December. Instead, a "cost of living bonus" was provided, which automatically increased wages by $1.25 a week for each five points' rise in the cost of living index number. This was a modest provision, compared to the large *basic* increase in wages which the United States railways were obliged to concede. On the other hand, all prices were "frozen" in Canada, effective last fall, and this has had the result of virtually estopping further rises in the "cost of living bonus." With their labor costs thus protected, the Canadian carriers have not increased their freight rates—instead, such rates have been "frozen" just as have other prices in the Dominion.

It is somewhat strange that the unions which acquiesced in the "cost of living bonus" plan in Canada are the very same international organizations which absolutely refused, in the United States last fall, to be content with a similar plan for protecting their earnings during the emergency. The unions in Canada accepted the "bonus," whereas, in the United States, they insisted that their increases be both much larger, and that they be permanent rather than "pegged" to the cost of living—this despite the fact that the average wage scale south of the border was already higher than it was in the Dominion.

### Carloadings Don't Tell the Whole Story Any More

Aside from a less-inflationary policy on the part of the unions, however, which is necessarily reflected in rates, there are far more elements of correspondence between the operations of the two national segments of the continental railroad system than there are points of difference. For example, consider the remarkable tendency, in the United States, of ton-miles to increase so much more rapidly than carloadings. The same significant phenomenon is to be observed in Canada. Reference has already been made herein to the fact that in Canada ton-miles in 1941 were 120 per cent of the 1928 level, and 110 per cent in the United States. Well, how do car-

At Moncton, N. B.—A Busy Spot Nowadays




**A Target — Towing Craft on Its Way from Montreal to the Sea**

loadings correspond? In Canada, in 1941, carloadings were 14 per cent *less* than in 1928 and, in the United States, 18 per cent less. Canada in 1941 performed 20 per cent *more* freight service with 14 per cent *less* carloads, and the United States carriers 10 per cent more service with 18 per cent less cars loaded.

### Freight Moves Farther Than It Used To

The obvious explanation is that freight is being loaded somewhat more heavily per car now, than in 1928; and the average car is getting a much longer haul. The shorter trips are being made by truck in both countries; and in both countries the diversion of Panama Canal shipping, and other kindred causes, have given the railroads much more traffic to haul all the way across the continent than they were ever called upon to deal with before.

Both the principal Canadian railways have suffered from a considerable enlistment of their personnel in the nation's armed forces—at a time when an enlarged trained personnel has been, of course, greatly needed. Nevertheless, the carriers have not so far found it necessary to seek exemption of their personnel from compulsory service, although, in some cases, local boards have deferred the induction of employees actually engaged on war work. Incidentally, this latter presents another aspect of service to the nation which the Dominion rail carriers are rendering, that is, manufacture of munitions and other materials of war in railway shops—an expedient which is as yet only in the incipient stage in the United States.

The really phenomenal increase in traffic with which the Canadian carriers have thus far dealt successfully has been dealt with by the same measures which have been similarly successful south of the international frontier, namely, heavier and more rapid loading and expedited unloading of freight, and a general effort all down the line to secure the maximum possible performance from each unit of power and rolling stock, combined with the limited installation of additional trackage and signaling at a few strategic points. A leading operating executive of the Canadian Pacific has summarized the recent performance of that property in the following words:

"The volume of freight traffic handled during 1941 was greater than that of any previous year, the revenue ton-miles being 39.61 per cent greater than for 1940, and 21.5 per cent above the peak movement of 1928. This record movement took place without any material additions to railway equipment and was the result to a large extent of the wholehearted co-operation on the part of the shipping public, and the utilization of motive power and other rolling stock to a degree never before reached in the history of the company.

"Through transcontinental freight schedules and overnight merchandise services have been maintained with reasonable regularity, and excess accumulation of cars under load at seaboard terminals has been avoided by strict regulation of loading permits which are applied to export shipments.

### Training New Employees

"At the close of the year 3,758 officers and employees had enlisted in the armed forces, and more than 6,000 were engaged exclusively on production of war munitions which is being undertaken in the company's shops. This situation, together with the greatly increased volume of traffic, necessitated bringing into the service large numbers of new employees without previous railway experience. The training of new employees in safe and efficient operation has been satisfactorily met by the appointment of additional trainmasters, traveling engineers and firemen and rule instructors.

"It has so far been found unnecessary to take any formal steps to procure deferment from military service for any class of railway employees, although local selective service boards have co-operated to the extent of granting temporary deferment in cases of shop employees engaged on war munitions work."

An operating department executive of the Canadian National had made the following resume of the "what" and the "why" of that organization's recent accomplishment:

"A review of the freight handling records of the Canadian National Railways for the year 1941 reveals that 65,370,412 tons of freight were carried; this compared with 55,060,000 tons for the previous year, an increase

of 18.73 per cent. A similar figure for the year 1939 shows a total of 45,691,284 tons, so that since the beginning of the war the Canadian National Railways show an increased freight handling of almost 20,000,000 tons annually, or an increase of 43 per cent.

"This remarkable increase in tonnage consists largely of war production material, either direct for export or components of wartime effort in the Dominion, in addition, of course, to the general impetus that has been given to domestic traffic.

### New Facilities at Strategic Points

"The problems involved in handling this increased tonnage have been intricate, but have been successfully dealt with as occasion demanded by the operating department. Among these problems were the development of additional yard trackage at strategic points; the provision of centralized traffic control in a section of the line where the density of traffic required greater facility and flexibility of operation; lengthening of passing tracks; and the provision of additional enginehouse and other facilities at both terminals and en route.

"The performance records of the Canadian National show the results of this foresighted policy, as, for instance, gross ton-miles per train-mile in 1941 were 1,640 as compared with 1,562 in 1940. Similarly, the net ton-miles were 736 as compared with 683. Gross ton-miles per freight train-hour in 1941 averaged 26,421 as compared with 25,751 in 1940. In 1935 a comparative figure in this respect was 21,748. The average number of cars handled per day in yards in 1941 was 90,880, as compared with 75,923 in 1940. The serviceability of freight locomotives was raised from 71 per cent in 1940 to 76.4 per cent in 1941. The serviceability of freight cars was raised from 95.6 per cent in 1940 to 96.4 per cent in 1941. One very outstanding performance is that in 1941 the car-miles per serviceable car-day stood at 47.7, which compared with 40.9 car miles per serviceable car-day in 1940.

### Ready to Handle All Traffic Offered

"All of this indicates that notwithstanding the very heavily increased tonnage, as well as the fact that passenger traffic, including concentrated movement of troops, was greatly increased, the Canadian National Railways have been able to continue a very fine performance and at no time during the year has there been indication of congestion at any strategic point where delivery of export or other important freight traffic has been endangered. The indications are that this system is in a position to adequately take care of all the freight business that may be offered.

"Among the problems facing the Canadian National Railways is that of an adequate supply of trained labor. It should not be overlooked that to date 5,400 of our employees have already enlisted for active service, the majority of whom are skilled in their particular calling. To date it has been possible to keep the ranks well filled and in some categories arrangements have been made to permit men reaching age 65 to remain in the service provided they are physically fit to do so."

Still another railway man, closely informed on all phases of transportation in the Dominion, offers this further explanation for the railways' successful performance (and the culmination of the accomplishment has not yet been recorded):

"Shippers are co-operating to the fullest extent, both individually, through shippers' advisory boards and other shipper organizations, to accomplish heavier loading of cars wherever possible and also more expeditious loading and unloading by shippers and receivers in order to assist in the general program of making the most of available railway equipment."

How familiar that all must sound to every person who knows transportation, whether north or south of the international frontier. The Dominion carriers, in sum, are doing the same kind of a job that the rest of the rail carriers on this continent are doing. They are facing practically the same problems, and they are surmounting them with almost exactly the same methods that are being successfully employed in the neighboring Commonwealth. A soldier for Uncle Sam, and a member of His Majesty's Canadian forces, would be hard to tell apart, except for the uniform. But between a Canadian and a citizen of the U. S. who are both railroaders, not even the uniforms differ.

The science and art of railroading does not vary at the border either as to form of content. American lines penetrate Canada; and, not only private Canadian railways, but lines actually owned by the Dominion itself, do a large commercial business within the borders of the neighboring Republic. The two great Commonwealths have learned to live in harmony and co-operation with each other; and in no activity is this mutually-beneficial mingling of interests so marked as in the performance of railroad transportation service. Which is a fortunate thing, when the interests of the two neighbors are now so completely identified in the dangerous business of war.

## Modern Signaling Keeps Freight Moving

(*Continued from page 1020*)

ficiently long to hold an entire train or half of a train, the departing road locomotives can, with one or two moves, make up trains and depart from yard tracks directly, thus eliminating the departure yard that was formerly considered a necessary part of every terminal.

In a yard equipped as explained above, the maximum classifying capacity is available at all times. Cars can be classified at a rate of as many as 150 to 200 an hour, thus keeping abreast of arriving trains, and by breaking up the last few arriving trains with special expedition, all departing trains or switching cuts for delivery can be made ready promptly. In such yards, the average delay to cars is reduced by hours as compared with previous operation, a development which is of paramount importance to shippers in these days.

On those lines where increased capacity is necessary today to meet the demands of the war program, the first and most logical solution is to install centralized traffic control. Even if justified for the future, it is doubtful if additional tracks could be planned and installed in time to be of much assistance during the present emergency. Furthermore, the amount of metals required for signaling installations is but a small fraction of that needed for the new locomotives or additional tracks, which would be required to provide the same increase in transportation capacity. For these reasons, priorities are being secured for the materials required for several extensive centralized traffic control projects, which can be installed within a few months, and thus become a further important factor in the handling of war traffic.

In brief, the railroads are making rapid strides in the utilization of modern signaling facilities as a means of eliminating delays, and thereby keeping their freight trains moving at the maximum speeds for which the locomotive and track are designed.

# *This War Is the Biggest "Railroad War" in History*

**Trucks, tanks, planes, ships have replaced iron horse on some specialized jobs, but have added far more tons to rails than they have diverted**

**INDISPENSABILITY OF THE RAILWAY to Modern Warfare Is Witnessed by Chinese (in Photo at Right) Who Are Building One by Hand**

Press Assn. Photo

THE "fog of war" has concealed nothing, perhaps, so effectively as it has the part that railroad transportation has played in the present hostilities—and the larger duties which may fall to such carriers before victory is won. The activities of ships, airplanes and tanks are so much more spectacular (because more often involved in conflict) than those of the railroads that, when the war correspondents mention transportation, they include the railways but infrequently. Moreover, most railway activity goes on behind the lines. The enemy knows relatively little about it—and it is sound policy to keep him stewing in his ignorance; which is a further reason why the public has little knowledge about how this war depends on the railways.

### It Takes Railroads to Put Tanks in the Field

The fact of the matter is, though, that the present conflict is by far the greatest "railway war" in history. Planes, ships, trucks have not supplanted the railways but, on the contrary, their very presence at the scene of combat—with so much other mechanical equipment—calls for more supporting railroad transportation than ever. A little reflection will demonstrate why this is so:

Consider tanks for instance—vastly expensive and indispensable weapons where actual fighting is going on. When they are so scarce (compared to the need), why wear them out on a drive of 300 or 400 miles to the place of action? Common sense dictates that they be *hauled* as near as possible to the point where they are going to be used, rather than worn out in prolonged cross-country treks. Another thing: where tanks are used, high quality fuel for them is often a precious commodity—not to be wasted on unnecessary "dead-heading." Better carry them as far as possible by rail, where coal or fuel oil will move them, and save the gas for actual battle.

It is no disparagement to planes, ships or trucks to emphasize the indispensability of railways. These other transport tools are vitally necessary—but equally to be borne in mind is the fact that none of them can operate on an effective scale without a large quantity of dependable railroad transportation to back them up. Take planes, for example. Combat planes, obviously, do not solve supply problems, because they do not haul supplies. But even transport planes require a lot of assistance from surface transportation. They need airports and fuel—and adequate airports involve large quantities of materials and equipment, the provision of which would constitute an endless job for an innumerable fleet of transport planes. A modern transport plane and a modern locomotive are roughly equivalent to each other in horsepower. But the transport plane will do well to haul 10 tons of cargo, while the modern locomotive can handle 1,000 net tons—even on not too level a track.

### Mass Equipment Requires Mass Transportation

Trying to keep a modern army supplied with long-haul transportation, placing complete dependence on planes, would be a good deal like attempting to supply water to New York City in pails, hand-carried from Lake Champlain. In either case, so much effort would be used up in maintaining supply that the recipients would have little force left for any other purpose.

The situation is much the same with trucks. They are indispensable for local distribution—but they are extremely inefficient for dealing with large quantities of goods over long distances. For example, it has been reported that 80 per cent of the truck-mileage run on China's famous Burma road was consumed in hauling fuel to keep the trucks moving. Only one-fifth of the truck-miles on this road constituted net tonnage of precious military supplies to the Chinese armies. Such

statistics, however, are not needed to point the moral of rail vs. truck, where movement of military supplies in quantity is concerned. The photographs herewith—showing Chinese, building a railroad practically with their bare hands to parallel a part of the Burma road—afford conclusive, and moving, evidence of the estimation which these brave people have of even a modest little railroad as a means of defense. When a war is fought nowadays without adequate railroad support, it is a matter of painful necessity—not choice.

### No Other Agency Can Supply Materials in Adequate Quantity

There isn't much difference—except in special local situations—between the effort or cost of a fair-to-middling highway and a railway of approximately the same standard of construction. But a single train on the railroad will haul as much as from 50 to 100 trucks. The train will represent a smaller investment than trucks of equivalent carrying capacity and, while 80 per cent of the truck-miles may be used up in hauling their own fuel, fuel-hauling for its own operation is seldom if ever a matter of concern in running a railway. Moreover, trucks require a specialized fuel, which is found in comparatively few places and must be refined by a process requiring elaborate machinery; but trains can be run with almost any kind of unrefined fuel—even wood. Finally, it requires upwards of 100 men to move goods by truck which 3 or 4 men can care for on the rails.

### Unsafe to Rely Entirely on Shipping

Planes and trucks, it is clear, make poor substitutes for railways in supplying the overland transportation needs of a modern military campaign. Ships, also, while they are efficient carriers, are disadvantaged in that they can go only where there is water to float them. This may often involve long, round-about hauls—and exposure to enemy action. For example, take Burma. That country has a system of railways extending northward into the interior, but not coastwise toward India. Even far in the interior the railways of Burma are not connected with those of India—the rail carriers having been, plainly, constructed as "feeders" to oceanic and coastwise shipping. With control of the port city, Rangoon, lost to the enemy, the Burmese railways were no longer of use for supply to the British defenders. Lack of supply and reinforcements appear to be the reason the British troops in Burma have had such tough going. And the beleaguered Chinese had to turn feverishly to work to complete another highway (the Assam road, connecting with the Indian railways) to replace the Burma road. As Chaucer said:

> I holde a mouses herte nat worth a leek,
> That hath but oon hole for to sterte to,
> And if that faille, thanne is al y-do.

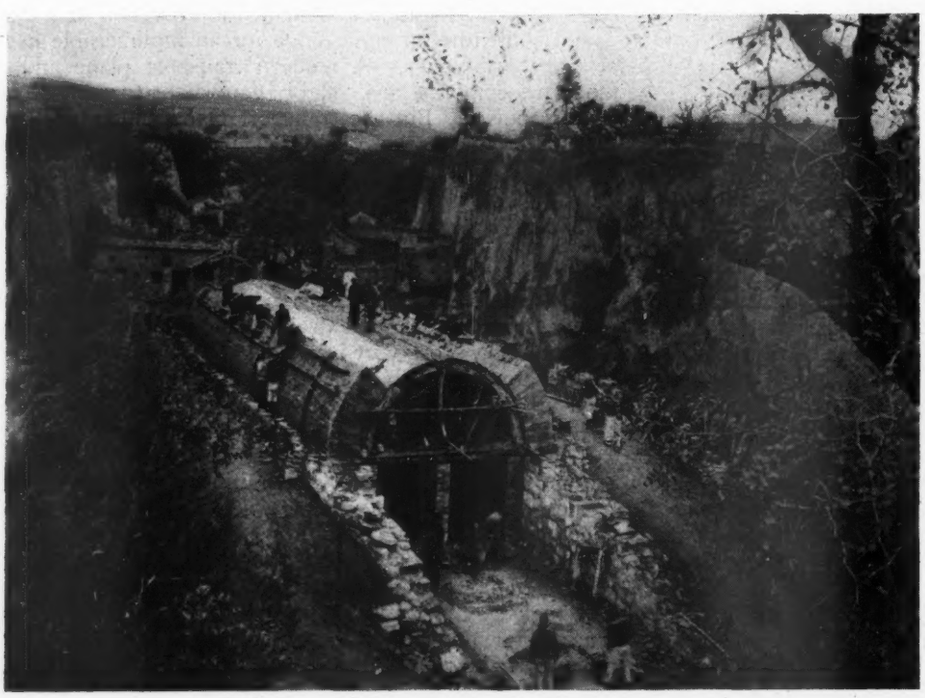
Which is the unfortunate situation which arises when entire reliance is placed on vulnerable shipping, while alternative overland transportation is neglected.

### From Palestine to Iraq

Our British allies, from painful experience, thoroughly understand the importance of internal, overland communication and—especially in the Near and Middle East—they (and the Russians) are working hard at establishing connecting links between heretofore rather isolated railway systems. For one thing, what is needed very badly is better transportation facilities between Palestine (in British hands) and the Persian gulf—to avoid complete dependence upon water-borne transport around Arabia. A considerable step in this direction has recently been virtually completed by the construction of a standard-gage line from Palestine to a connection with the standard-gage lines in Syria. There was a rail connection before, but it was round-about and narrow-gage. Upon the completion of this new line, through rail services, without change of gage, will be *physically* possible all the way from Egypt into Turkey and Europe on the north, and as far east and south as Bagdad in Iraq (which is connected with the Persian gulf by a narrow-gage line to Basra).

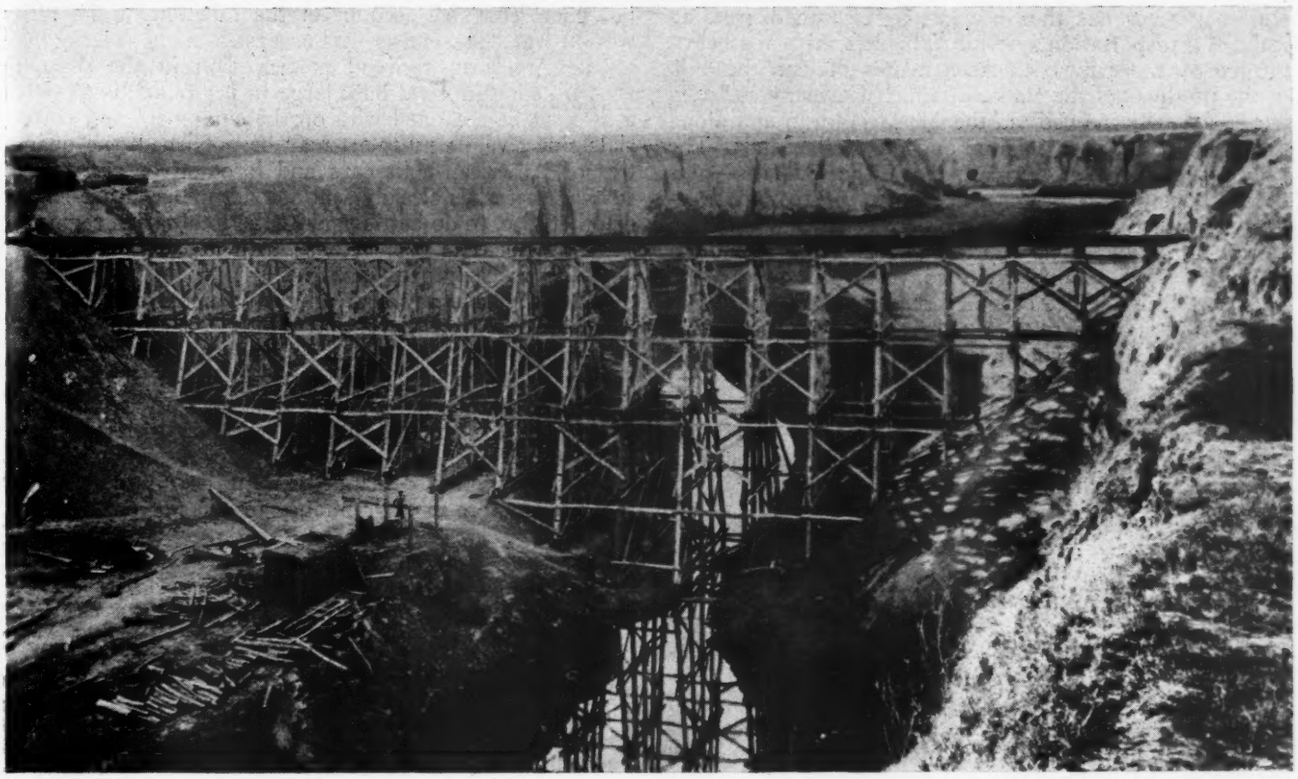
### Via Persia Into Russia

In Persia, the north-south Trans-Persian railway (standard-gage), connecting the Persian gulf with the



**Building a Railroad in Northwest China—It Is Easier to Build a Tunnel to Divert a Stream Than to Erect a Bridge**

Press Assn. Photo



Press Assn. Photo

**Steel Is Scarce, So They Build Railroad Bridges of Wood, Shensi Province, China**

Caspian sea, is a main allied supply route into Russia. The physical characteristics of the line have been considerably improved, greatly increasing its traffic capacity —and a branch is being built, northwestward, to connect with the southern terminus of the Russian railways at Tabriz (west of the Caspian sea), while other branches, eastward, are designed to improve connections (partly in conjunction with new highways) with the railway systems of Russia (east of the Caspian) and Northwestern India.

### Activity in Africa

There is also said to be railway construction activity going on in Trans-Jordania, at the head of the Red sea; and between the Red sea and points in the Nile valley. Through railway service has been, or is about to be, instituted across the southern one-third of the African continent on several meter-gage lines already built, thereby avoiding a longer haul (in miles as well as in time, but especially in time) around the Cape of Good Hope.

The Vichy government is constructing a standard-gage railway across the Sahara desert, southward from Morocco, which will eventually hook-up with a meter-gage line which extends eastward inland 800 miles from Dakar. The Sahara line would also connect with the railways of Nigeria and give Mr. Hitler's collaborators a fine line of internal communications, which the navies of the United Nations could not get at. It is significant also that, before embarking on this Trans-Sahara project, the Vichy government carefully examined the possibilities of a cargo air line and a truck highway, and chose the agency which would do the desired job most economically and effectively. Dakar is now connected with Morocco by a truck route, but the road is not sufficiently improved to make transportation economical.

All in all, it may be said that the Near and Middle East and parts of Africa are today witnessing the most intensive railway development in history—at a time when requiems have, for ten years and more, been frequently said over the railways by their youthful contemporaries in the transportation business!

So much for railways in this war where there were none before—or where those that existed were inadequate. But the waring powers have also learned a great deal about the demands which armed conflict puts on well-developed railway systems. Mr. Hitler, who seems to have so thoroughly planned most of his mischief in advance, has not been so foresighted with respect to providing adequate railroad support for his operations. A theatrical fellow, he seems to have devoted most of his pre-war transportation attention to airplanes and his much-publicized "autobahnen." Considerable was said in the early days of the war about "a railroad breakdown" in Germany, but quite likely this was mostly Nazi propaganda. Nevertheless, the beginning of the war did not find the German railways with spare capacity sufficient to deal effectively with the load which was to be put upon them.

### Blocking Europe's Barges Gives Hitler a Headache

The extent to which Western Europe normally depends on water routes, rather than railways, for the transportation of bulky commodities, is not generally realized. Along the coast from Southern France all the way up to Kiel there are numerous rivers penetrating far inland—goods may readily be barged down one of these streams along the coast and up another one—such service being normally available for a large proportion of the industrial area of Western Europe. The railways serving this area have no more enjoyed the heavier, slower traffic of this region than have the American railways the coal and petroleum traffic of the middle and North Atlantic. But now, coastwise movement of freight has been largely stopped by the activity of the R. A. F.,

and each river has thus become, to a large degree, an isolated transportation system. This has thrown a heavy burden on the railways. As a matter of fact, the bulk of the products of the Balkans, which Germany so badly needs, normally moved via the Mediterranean and along the coasts of France, Belgium and the Netherlands. The railways connecting Germany with the Balkans—plus the Danube waterway—are not sufficient to cope adequately with this traffic.

Mr. Hitler has done considerable boasting about the genius of Nazi engineers in converting Russian gage (5 ft.) railways in the occupied region to standard gage. This boast is very revealing, because it indicates that the Nazis did not capture any considerable amount of Russian rolling stock (else the gage would not have been changed, rendering such vehicles useless). It also means that—to operate his supply lines in Russia—Hitler has had to levy on Western Europe for large supplies of rolling stock, which were scarce enough anyhow.

### It Doesn't Pay to Skimp on Rolling Stock

Recent reports from Germany indicate that transportation there is a sorry state—with civilian travel all but prohibited and with the railways far in arrears in dealing with freight traffic. If such be the situation in Germany, it goes without saying that it is much worse in the remainder of Europe—because, of course, the *Herrenvolk* have helped themselves liberally to the conquered countries' equipment. Now, in the midst of his other production problems, Hitler has to divert manufacturing facilities and materials to the construction of cars and locomotives. It is reported that, in 1941, the manufacture of both freight cars and locomotives was ten times what it was in the last year of peace. The great seer was not much more foresighted, it seems, in dealing with railways than he was when he decided, last summer, to take on a war with Russia.

The deeds of the railways of Great Britain during this war would fill many books (and doubtless will, when the full story can be told). These railways have not only had to take on a vast military load, plus a large tonnage from coastwise shipping, but they have done so despite particular attention from the Luftwaffe. But there is this difference between the railways of England and those of the Continent under aerial attack, namely, that the British railways were built with private competitive capital—and thus have available many alternative routes. The carefully-planned government railways on the European Continent may be more "rationalized," but they are short on alternative routes and duplicate facilities when they receive attention from the air.

### American Railroading in War Service

The Americans have not yet had the opportunity to show their prowess in railway operation in a theater of war. But railway men are being trained for military duty, and, in due course, will be given occasion to demonstrate their skill. The organization of the Military Railway Service has been described in addresses, published in *Railway Age,* by Colonel Lewis T. Ross, chief, railway branch, troops division, Corps of Engineers (issue of January 24, 1942) and Colonel Carl R. Gray, Jr., manager, Military Railway Service (issue of February 28, 1942); and current developments with respect to this Service are reported in *Railway Age* issues from week to week. In his recent book, "This Fascinating Railroad Business," R. S. Henry, assistant to president of the Association of American Railroads, gives a brief but comprehensive account of the function of the railway in war—present as well as past.

But American railroad participation in the present war, if it does not yet bulk large in personnel, is already a force to be reckoned with on the equipment and materials side While no totals may be published, the quantity of American-built cars and locomotives and other railway materials already sent abroad, under "lease-lend" or otherwise, to do battle against the totalitarian regimes, is of considerable proportions; with much more on the way and in early prospect.

Regarding the railways on the "home front" in this war, nothing need here be said—because all the rest of this publication deals with that subject. The "railroads are ready," both industrially and professionally, to meet the challenge of the "greatest railroad war" in history. The plane, the ship, the truck, have not deprived them of wartime duties, but have called upon them for service far exceeding that demanded in the days when planes and trucks were in their infancy or did not exist at all.

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VITAL MOVEMENT OF TROOPS and equipment for Britain's armies in the Middle East, as well as supplies for a civil population of 50,000,000 people, are being largely handled by 15,000 men who in peace time work on the railways and docks of Britain, Australia, New Zealand, South Africa and India.

Formed into companies of the Royal Engineers, New Zealand, Australian, South African and Indian Engineers, these men carry on in the Army the work of enginemen, trackmen or stevedores, just as they did at home. Operating companies, consisting of enginemen, firemen, signalmen (called "blockmen" in the Army), brakemen, switchmen, boilermakers and machinists, conductors and stationmasters, each have about 100 miles of line to operate, some of it—like that on the Trans-Iranian railway—over mountain ranges in wild, inhospitable country. Much of their rolling stock has seen service on the railways of the United Kingdom, and more than 100 locomotives and some 1,500 freight cars have been sent to Iran alone since last September.

Where a railway has to be built from scratch, a construction company and a survey company are called in to erect shops and lay tracks. Trackmen and other men from the railways make up a company of about 300 who, with the assistance of large gangs of native labor, can construct up to a mile of track a day. In this way over 1,000 miles of track have been laid in the Middle East on strategic main lines and in sidings since the outbreak of war. Ports throughout the Middle East are manned by dock companies, consisting of stevedores, checkers and crane operators from British ports, all experts in their jobs.

Before going out to their jobs, the British Army's railwaymen are given a course of training at an Army railway school and a film will shortly be seen in overseas countries showing them at work there. The foregoing information is from the British War Office.

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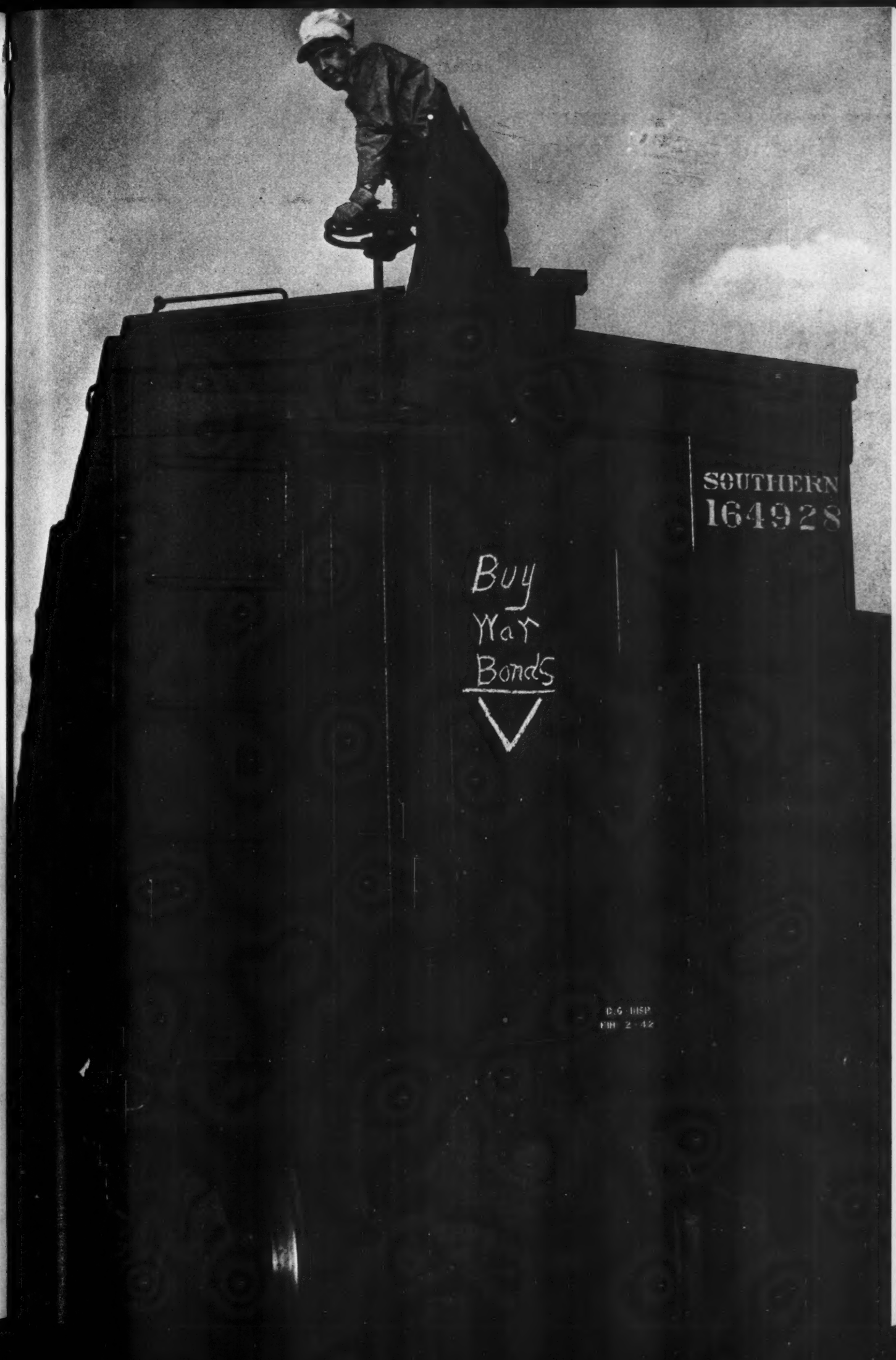
"INVISIBLE TANKS."—Tanks are now being carried by "invisible" routes to Britain's ports on special cars in trainloads of 24 at a time. Production is so arranged that batches of them are ready at night, when they are loaded on the trains and sent to the ports by special routes so as to arrive there in the dark. The result is that very few people in Britain have an inkling of this "invisible" traffic.

The new "rectank," or flat car on which two heavy Valentines can be carried, is a special feature of these tank trains. Where there is not a loading dock a ramp is used, but the tanks can, if necessary, climb aboard themselves. Worked out by the railway operating men in conjunction with the British War Office, these "rectanks" allow the full width of railway clearances to be used so that with the larger tanks there are only inches to spare.

This information is from the British Railways' Press Office.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# Post-War Planning By and for the Railroads

By Elmer A. Smith*

SHOULD the railroads, in such a crisis as this, devote some thought to their place and problems in the post-war world? Aristotle a long time ago said that the purpose of war was peace. We know that life goes on, and that notwithstanding the unbelievably vast scale of the present war, the world when peace comes will again take up the burdens and responsibilities of a civilized way of life. The railroads, therefore, with a full realization that their essential job is to help win the war, must, in the public interest as well as their own interest, consider their post-war problems and what can be done to meet them.

Post-war planning for railroads has two aspects: First, with respect to men; and, second, with respect to the railroad machine. There is serious doubt whether, so far as the executive and supervisory forces are concerned, the railroads have given enough time and thought to the selection and the training of men who might show some promise of ability and leadership, who might come to accept the day's problems as a challenge, and whose enthusiasm and energy in their earlier years might not come to be dulled by routine. But however this may be, they cannot be indifferent to this problem in the future. They are competing with younger agencies of transportation, staffed by younger men, not tied to the past or bound by the practices of years.

Post-war planning with respect to the relations between railroad management and railroad employees presents many difficult and at times discouraging problems. It is nevertheless to be hoped and believed, that these problems are not without their solution if the interested groups will bring to them some spirit of toleration, of understanding, of sympathy, and of great patience.

### Re-examine Approach to Employee-Relations Problem

The railroad managements, therefore, need to re-examine, as many of them are doing, their whole approach to the problem of employee relations: to the place of their employees in a railroad organization, to the means by which there can be achieved a greater degree of cooperation between management and men, a wider distribution of initiative, and a greater interest of men in the problems and responsibilities of management. The Illinois Central is operating with some considerable success a "suggestion bureau," whose duty it is to consider suggestions from employees for improving operation, service, or reducing expenses. Cash awards are made by a committee, composed of representatives of the different departments and of the railroad brotherhoods, for suggestions actually put into practice. Men and management on the Illinois Central are cooperating in the sale of defense bonds to all employees.

Safety organizations, composed of local officers and representatives of the men in the shops and roundhouses, have been substantial factors in management-employee cooperation. The establishment of credit unions managed by employees has brought about a greater feeling of solidarity among the employees. Many railroads publish each month an employees' magazine. On the Illinois Central, in addition to the employees' magazine, each employee receives every quarter a report from the president. The past few years have seen social progress on the railroads that augurs well for the future. The establishment of old age benefits and unemployment compensation are milestones in that progress.

Railroad employment is, of course, dependent almost wholly upon the volume of traffic, and stability of railroad employment depends upon stability in the industrial and economic life of the nation. The fundamental problem that will confront the railroads when the war is ended is that of the volume of traffic. What are the railroads doing at this time, what can they do, in the way of planning for traffic during the post-war period? Volume of traffic is the very keystone of the whole railroad arch.

### What Factors May Affect Post-War Traffic Volume?

What are the factors that may affect and control the volume of post-war traffic on the American railroads? Everyone here knows that we are undergoing at an ever accelerated pace an economic and industrial revolution. New methods of manufacture are being developed. Commodities hitherto unknown to commerce are almost daily making their appearance. The industrial map of the country is being remade. To what extent have the railroads interested themselves in these developments?

They have bent every effort in the past few years to locate on their lines industries engaged in the production of these new articles of commerce. These industries are now to a very large extent engaged in war production. The past year has seen the location on the railroads of industries engaged solely in the production of war materials and supplies. The industrial departments of the carriers are working closely with all these industries with a view of aiding them, when peace comes, in the conversion of their plants from a wartime economy to a peacetime economy.

It is also evident that the longer this war lasts the greater the demand will be when peace comes for the things required by our standard of living. Post-war planning will take into consideration the various articles that will have to be manufactured and transported in enormous quantities in the post-war years to catch up with the wants of men remaining unfilled during the period of the war.

Then there are changes in the price policies of the railroads, some hint of which we have seen in recent years, that may affect the volume of the traffic. The recent decisions of the Interstate Commerce Commission dealing with quantity or trainload rates, pickup-and-delivery service on merchandise, and pickup service on livestock within terminal areas, all constitute proof that the Interstate Commerce Act does not tie the hands of the railroads to the past, but that on the other hand this Act has within itself a capacity for growth and adaptation to the needs of commerce as those needs develop from time to time. Regulation cannot serve as an excuse for inertia.

The Illinois Central, with an eye to the future, has just completed a long-range study of the major sources of its traffic and revenue, the course of its traffic in each of the more important commodities over the last 25 years, and the factors that have affected the volume of the traffic.

Coming now to the factors affecting the volume of traffic in the post-war world that are beyond the control of the railroads: The first question is, what will be the transportation policies of the government in the post-war years? Will the government continue its promo-

* Senior general attorney, Illinois Central. This article is an abstract of an address by Mr. Smith to the National Industrial Conference Board presented on May 20.

tional policies with respect to those agencies of transportation that compete with the railroads? Will the state and federal governments continue to pour money into the construction of hard roads and permit those roads to be used by common, contract, and private carriers for the purpose of their own business without an adequate user tax? Will the government continue to improve and maintain the inland waterways of the nation, and permit such waterways to be used by these classes of carriers without any toll whatever?

### Will Government Subsidy Policies Continue?

One result of the growth of these competing agencies of transportation, a part of whose costs is borne by the public at large, has been the increasing use of the railroads as a "standby" agency. The great industries of the country have placed their private fleets upon inland waterways and the Great Lakes, and their trucks upon the highways. Contract carriers limit their transportation services to the hauling of those commodities that they know will be remunerative to them. These classes of carriers have cut deeply in recent years into the volume of rail traffic. Yet there is not a single shipper who could get along without the railroads. The railroads have found themselves rendering a "standby" service, without any means of collecting a charge that would represent the value of that type of service. An adequate system of rail transportation cannot thus be maintained.

It will be difficult, therefore, for the railroads to make any intelligent estimate of the volume of their post-war traffic until they know whether the federal and state governments will continue their present promotional policies towards competing agencies of transportation. The volume of traffic incident to the war has covered up only temporarily the competitive problems of the railroads.

The National Resources Planning Board has recently recognized the existing inequality in treatment among these competing agencies, and has proposed that it be removed by the public ownership of all rights of way. Would it not be better, in order to bring about an equality among these different agencies, to charge the user of the facilities furnished by the state and federal governments a fair user tax rather than for the government to expend large sums in purchasing railroad rights of way?

While the railroads, of course, must do the best job they can under such Congressional policies as may be in effect from time to time, as unfair as the railroads may think those policies to be, the railroads are encouraged by the fact that Congress took notice of these inequalities when it made provision in the Transportation Act of 1940 for the establishment of a Board of Investigation and Research. Post-war planning for the railroads, therefore, must take into consideration the findings and recommendations that will in due time be made by the board.

But what about the post-war period when trucks, ships, and airplanes will be available for commercial traffic in numbers that stagger the imagination? Obviously, motor trucks will return to the highways, ships and boats to the ocean and to the inland waterways, and there will be airplanes operating with an efficiency and capacity not only for passenger but for freight service that we can even at this date hardly envisage. And it must be remembered that the ships, airplanes and trucks now being constructed are getting the benefit of wartime testing and development. This clearly will result in tremendous improvements in design, efficiency and capacity. The railroad models, on the other hand, are "frozen" for the war period.

It is difficult for anyone to make any estimate of the degree to which the competition of these agencies of transportation will affect the railroads in the post-war period. We know it will be serious under any circumstances. But it will be very much more serious if the present promotional policies of the government are continued.

And in so far as technological changes and operating methods are concerned, the performance in the past gives the best promise for the future. The increase in the efficiency and economy of the railroads in the last two decades has been nothing short of astonishing.

Railroad rates in the post-war period depend to a large extent upon the volume of the traffic. The public unquestionably has a greater interest in rail rates than in the rates of any other agency of transportation. The public, therefore, ought to consider, when looking at the post-war years, what the factors are that affect rail rates and to realize that no planning on the part of the railroads can overcome the effect on railroad unit costs and railroad rates of a substantial decrease in traffic volume.

What about post-war planning in so far as railroad finance is concerned? What can be done at this time to insure not only the solvency of the railroads in the post-war world but also the availability of funds that will be urgently needed for new equipment, new facilities, and new machinery? Problems of railroad finance are tied up with the volume of traffic. Only through the maintenance of a stable and substantial volume of traffic can the well-being of the railroads over the years be secured.

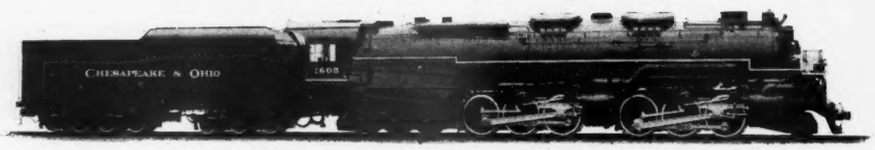
But it would seem that some provision should be made at this time to insure that funds will be available, when the war is ended, for improvements to the railroad plant, for the purchase of equipment and for maintenance work that must be done when materials are again available. One method would be for the government to provide, within certain limits, for the purchase by the railroads of government bonds, paying no interest, and payable at specified periods following the cessation of hostilities. Money thus invested would be exempt from income taxes. The proceeds of the bonds would be expended for improvements and betterments, new equipment, new machinery, maintenance, and any other purpose that would maintain the purchasing power of the railroads, and indirectly that of industry generally, and thus aid in maintaining railroad employment.

The Interstate Commerce Act as it now reads and as presently construed and applied by the Interstate Commerce Commission, places unjustifiable handicaps upon the railroads. A railroad ought to be permitted to use motor vehicles when in its judgment the use thereof would improve or cheapen the service. The fact of the matter is that if we were concerned wholly with the public interest, we would cease to think of railroads, motor carriers, water carriers and air lines, but would think only of transportation companies. There is no reason why a railroad, subject to regulation in every respect, should not be permitted to engage in transportation by motor vehicle, by water, and by air, along with transportation by rail. Regulation of the railroads on the whole has been successful, and we should place a greater trust in the processes of regulation. The application of the Sherman Anti-Trust Law to the railroads, in view of the existing regulatory laws, is an anachronism, and so are land-grant rates on government property.

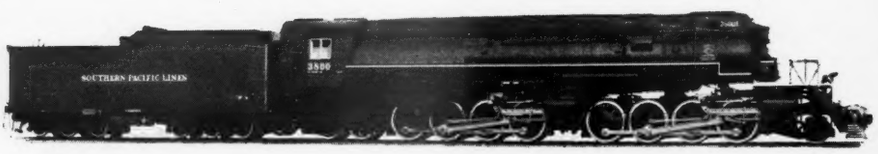
*News begins on second left-hand page*

# LIMA

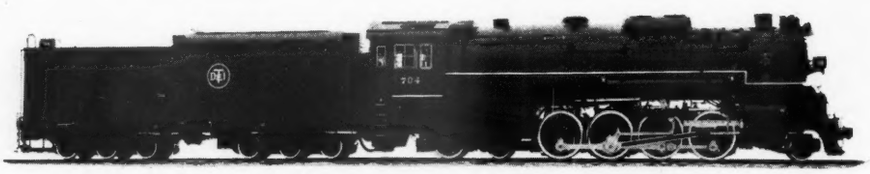
LIMA
LOCOMOTIVE WORKS
INCORPORATED




2-6-6-6 "Allegheny Type" locomotive
built for the Chesapeake & Ohio Railroad

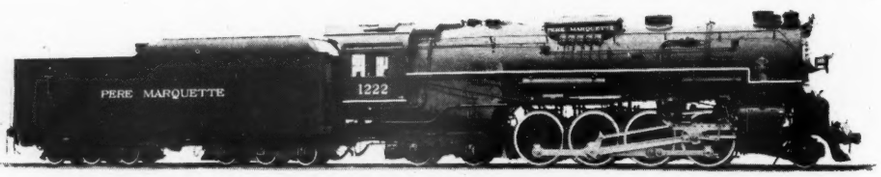



2-8-8-4 type Mallet
built for the Southern Pacific Ry. Co.



2-8-4 type locomotive
built for the Detroit, Toledo & Ironton Railroad Co.

PERE MARQUETTE




2-8-4 type locomotive
built for the Pere Marquette Ry. Co.

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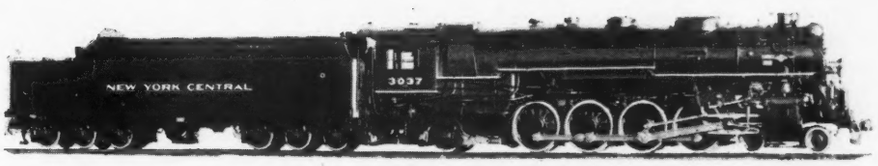
# POWER!

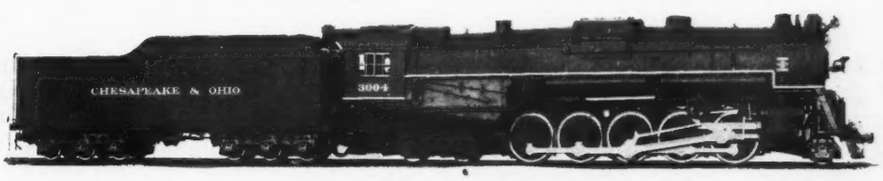
## ... to move Heavier Loads at Higher Speeds

NEW YORK CENTRAL SYSTEM




4-8-2 type locomotive
built for the New York Central System

C AND O




2-10-4 type locomotive
built for the Chesapeake & Ohio Railroad

WORKS, INCORPORATED LIMA OHIO

# NEWS

## Accidents Delay War Materials

### A.A.R. study shows that 38 trains a day are held up 22 hours a day

Accidents at highway-railroad grade crossings are unnecessarily delaying the movement of war and other materials, as well as troops and other passengers, at a time when every effort is being made by the railroads to expedite such traffic, according to a study just completed by the Safety Section of the Association of American Railroads.

An average of 38 trains a day or 1,137 trains a month, the Safety Section found, are delayed a total of 22 hours a day or 660 hours a month from this cause. Of the average number of trains delayed each month, 702 are freight and 435 are passenger trains. The delay to freight trains alone, averages 460 hours while to passenger trains, it amounts to 200 hours monthly, due largely to lack of proper care by motorists in approaching and passing over highway-railroad grade crossings. Eighty-two per cent of the accidents take place at highway-railroad grade crossings having special protection consisting of not only the standard sign that warns motorists they are approaching a grade crossing, but also some special device such as flashing lights, gates or watchmen. One-third of the accidents at grade crossings result from motorists driving into the sides of trains.

Frequently, motor vehicles derail trains at grade crossings, it was pointed out. Last year, ten railroad employees were killed and 61 injured as a result of collisions between trains and motor vehicles. In the past six years, 101 railroad employees lost their lives in such accidents and 398 were injured. Seventeen passengers on trains were injured from this cause in 1941, which brought to 173 the total number injured in the past six years. Instances have occurred when flaming gasoline has spread over locomotives when tank trucks were struck at grade crossings, causing horrible death to the engineer and fireman.

Damage to locomotives, cars and other railroad property resulting from collisions between motor vehicles and trains at grade crossings amounted to $373,111 in 1940. In the five-year period from 1936 to 1940, inclusive, total damage to railroad property amounted to more than $1,300,000.

Last year, 1,931 persons lost their lives in highway-railroad grade crossing accidents, the largest number in any year since 1930, the report declares. At the same time, 4,885 persons were injured. In 1941 there were, according to the Interstate Commerce Commission, 4,320 grade crossing accidents, the greatest number for any year since 1937. In the first three months of this year, 562 persons were killed and 1,580 were injured as a result of grade crossing accidents, compared with 525 fatalities and 1,380 injured in the same period last year.

Investigation by the Safety Section reveals that approximately eighty per cent of the grade crossing accidents involve motorists at crossings in the vicinity of their homes.

Increase in the number of trains and automobiles was said to account to some extent for the increase that has taken place in the past few years in the number of grade crossing accidents. With increasing traffic on the railroads, this potential danger is expected to grow.

"Partially through the use of the federal funds," concludes the report, "the railroads have eliminated 13,023 grade crossings during the seven year period, 1934 to 1940. For the most part, these grade crossings were located on the more heavily traveled highways. Some of the states also have been active in this matter. Despite this elimination program, however, new crossings almost constantly are being added owing to the growth of cities and communities. The elimination of every highway-railroad grade crossing in the United States would be a financial impossibility, running into many billions of dollars."

### ODT Bans Sightseeing Buses

The Office of Defense Transportation has issued an order banning the use of all sightseeing busses as of June 1 and limiting the use of chartered busses to members of the armed forces, war workers, and school children.

### ODT Advisory Committees

Coastwise and Intercoastal Carriers' Advisory Committees have been appointed by Director Eastman of the Office of Defense Transportation at Baltimore, Md., and Philadelphia, Pa. The committees will work with Director Ernst R. Holzborn of ODT's Division of Coastwise and Intercoastal Transport "on all port shipping problems."

The Baltimore committee is headed by T. J. Hooper of the Eastern Transportation Company, while S. C. Loveland of the S. C. Loveland Company is chairman of the Philadelphia committee.

## Carriers Hit New Peak in Tank Cars

### Haul 652,082 barrels daily into east coast area in week ending May 9

The daily tank car movement of petroleum and petroleum products to the east coast reached another new high of 652,082 barrels during the week ended May 9, according to an announcement by Petroleum Coordinator Harold L. Ickes. This was an increase of 1.7 per cent over the preceding week, when the movement averaged 640,478 barrels a day.

Meanwhile the presence of gasoline rationing and a threatened fuel oil shortage during the coming winter in the east coast states has caused political activity in Washington to also hit a new high insofar as methods of solving the oil shortage are concerned. No less than three congressional investigations were under way on Capitol Hill, with a fourth investigation by executive agencies promised on the oil shortage situation when this issue went to press.

In handling the movement for the week ended May 9 the 23 oil companies participating reported that they had loaded 20,287 cars. Including cars that were on the way back west for reloading, it is estimated that the east coast service was employing 46,350 cars, taken largely from other sections of the country.

At the same time oil shipments from California to Oregon and Washington dropped off—from 29,429 barrels daily to 28,480 barrels. The seven oil companies participating in the northwest movement reported loading 886 cars during the week, compared with 916 cars during the week ended May 2. Allowing time for empty cars to return to California, it is estimated that 2,225 cars are engaged now in the Pacific northwest service.

There could be little doubt that the oil shortage was the number one subject of discussion in Washington during the past week. The President discussed it with his Congressional leaders, talked about it at his press conference on May 19; members of Congress referred to it on the floor and in the Appendix of the Congressional Record; and three investigations, one each by the House rivers and harbors committee and the interstate and foreign commerce committee, and one by a Senate commerce subcommittee, got under way with generally the same witnesses and the same general type of testimony.

The House rivers and harbors commit-

tee was considering a project to construct and operate a pipe line and a navigable barge canal across Florida and to deepen and enlarge the present intracoastal waterway along the Gulf and Atlantic coasts so that barges filled with oil could be towed up those coasts to relieve the current oil shortage. The bill, which was introduced by Representative Mansfield, Democrat of Texas and chairman of the committee on rivers and harbors, would authorize $144,000,000 for this work. Various sectional interests appeared, all testifying in favor of the project.

At one point in the hearings on May 20, Representative Culkin, Republican of New York, denounced the "railroad lobby," declaring that the railroads "are utterly helpless; the country's system of transportation has broken down." The Interstate Commerce Commission, he declared, is only the "stooge of the railroads" and is the "most outrageous form of racketeering in the government today." He went on to assert that the railroads absolutely dominate every appointment made to the I. C. C., and that the "sleazy railroad lobby" carries on its work by "appointing the sons and no-good sons-in-law of the Interstate Commerce Commission to the payroll."

The House interstate and foreign commerce committee, under the chairmanship of Representative Lea, Democrat of California, also got under way with its comprehensive study of the oil situation and its relation to the kindred subject of rubber conservation.

On the same day, May 20, the Senate commerce subcommittee began its investigation of the oil situation and the question of whether or not the country's inland waterways could not be used to greater advantage during the present emergency to haul oil to the east coast. The subcommittee has $5,000 to spend for this purpose.

Also this week Mr. Ickes announced the commencement of actual work on the first of six projects in a comprehensive pipeline relocation program designed to increase the flow of oil to the east coast by approximately 200,000 barrels daily, largely with the use of second-hand pipe.

In the Senate Senator Capper, Republican of Kansas, suggested that it might be well to use the tank cars only from the termini of pipe lines in the middle west, thus increasing the cars' capacity by reducing the long haul to the east coast from Texas and Oklahoma points.

Leaving a legislative conference with the President on May 18, Majority Leader Barkley indicated that an effort would be made to build a pipe line from Texas to the east coast area, and Mr. Ickes said that he would again apply to the War Production Board for an allocation of steel for the pipe line. The project has been rejected twice before by the WPB and its predecessor, the Supply, Priorities and Allocations Board, on the ground that the steel could not be spared for its construction.

## February Bus Revenues 56.5 Per Cent Above 1941

Class I motor carriers of passengers reported February revenues of $13,728,953, as compared with $8,773,129 in February, 1941, an increase of 56.5 per cent, according to the latest compilation prepared by the Interstate Commerce Commission's Bureau of Statistics from 144 reports representing 148 motor carriers. Passengers carried increased 52.2 per cent, from 13,039,515 to 19,847,527.

| | Passenger revenue | | Passengers carried | |
|---|---|---|---|---|
| | February 1942 | February 1941 | February 1942 | February 1941 |
| New England Region | $578,524 | $382,814 | 1,547,933 | 990,961 |
| Middle Atlantic Region | 1,519,992 | 1,090,801 | 3,310,439 | 2,399,199 |
| Central Region | 2,160,212 | 1,448,817 | 3,612,277 | 2,542,501 |
| Southern Region | 3,695,532 | 2,424,953 | 4,822,252 | 3,162,676 |
| Northwestern Region | 425,859 | 298,110 | 373,267 | 279,134 |
| Mid-Western Region | 1,168,190 | 711,510 | 999,235 | 634,303 |
| Southwestern Region | 2,071,847 | 1,190,568 | 2,543,044 | 1,419,534 |
| Rocky Mountain Region | 131,971 | 77,566 | 101,923 | 62,620 |
| Pacific Region | 1,976,826 | 1,147,990 | 2,537,157 | 1,548,587 |

The breakdown by regions of the bus revenue and traffic figures which exclude data on charter or special party service, is given in the accompanying table.

## Rhode Island Commutation Fares

The Interstate Commerce Commission has instituted an investigation of the refusal of the Public Utility Administrator of Rhode Island to allow the New York, New Haven & Hartford to apply the Ex Parte 148 increases to its commutation fares within that state. The proceeding is docketed as No. 28827.

## Suspends Increased Charges for Storage at Ports

The Interstate Commerce Commission in Investigation and Suspension Docket No. 5119 has suspended from May 15, until December 15, various tariffs proposing to increase the charges for storage of freight in warehouses or cars at north Atlantic ports, when for trans-shipment by water beyond.

## President Signs Forwarder Bill

President Roosevelt on May 18 signed S. 210, which enacts a new Part IV to the Interstate Commerce Act for the regulation of freight forwarders. As noted in last week's issue, Congressional action on the measure was completed on May 11 when the House of Representatives adopted the conference report which had been approved by the Senate on May 7.

## N. J. Tax Laws Clarified

The railway tax situation in New Jersey was further untangled when the state legislature on May 18 passed a bill designed to clarify measures adopted last year. The action was taken in spite of the vigorous opposition of Jersey City's Mayor Frank Hague, which included full-page newspaper advertisements (paid for by the city's taxpayers) attacking the "railroad lobby" and Governor Edison. In effect the new legislation completes last year's railway tax law, both by releasing for public use payments made by the railroads that had been tied up pending legal interpretation of the law's intent, and also by waiving the state's claim against the railroads to some $6,600,000 in interest charges that accrued while the controversy awaited settlement.

## "Silver Meteors" Make Third Million Miles

The mileage record of the Seaboard Air Line's Silver Meteor streamliners on May 7 passed the three million mark. Beginning February 2, 1939, as a single train with a capacity of 280 passengers, on a schedule that provided service every third day, equipment has been added until daily departures are provided with space now regularly available for 630 passengers.

## Motor Certificates for Santa Fe

The Interstate Commerce Commission, Division 5, has granted the Santa Fe Transportation Company, affiliate of the Atchison, Topeka & Santa Fe, certificates authorizing common-carrier trucking operations over Kansas routes between Strong City and El Dorado, between Atchison and Topeka, and between Hutchinson and the Kansas-Colorado state line. The certificates are subject to the usual conditions designed to insure that the trucking services shall remain auxiliary to Santa Fe train service.

In the same report the commission granted the Transportation Company certificates authorizing bus operations between Strong City and El Dorado, and between Florence and Arkansas City.

## Army-Navy Review of War Praises Railroads

Railroads got a pat on the back in the joint Army-Navy report issued May 17 to review the progress of the war from the December 7 attack on Pearl Harbor down to the present.

The reference to the railroads came in that section of the report which cited the rapid movement of large numbers of troops and supplies overseas, immediately following Pearl Harbor. After noting that the functioning of the ports of embarkation was the "primary factor," the report went on to say: "Also, careful staff planning and the efficient cooperation of the entire American railroad system permitted the rapid movement within the United States of thousands of troops by rail from training areas in the central part to strategic points on both coasts."

## President Appoints Trade Barrier Committee

As an outgrowth of the Federal-State Conference on war restrictions, held under the auspices of the Department of Commerce May 5-7, President Roosevelt has appointed a committee of federal government officials to meet with the Executive Committee of the Governors' Conference with a view to affirmative action to elim-

*Continued on second left-hand page*

# 33 1/3% increase in T

(WITHOUT INCREASING THE SIZE OF THE LOCOMOTIVE)

# by application of...

The steam locomotive is possessed of latent power which now can be released by The Franklin System of Steam Distribution. This system, which is applicable to existing as well as new steam locomotives, is the result of years of experimentation, research and road tests and is offered to the railroads as a means of increasing train speed and load capacity without increasing the size of the locomotive.

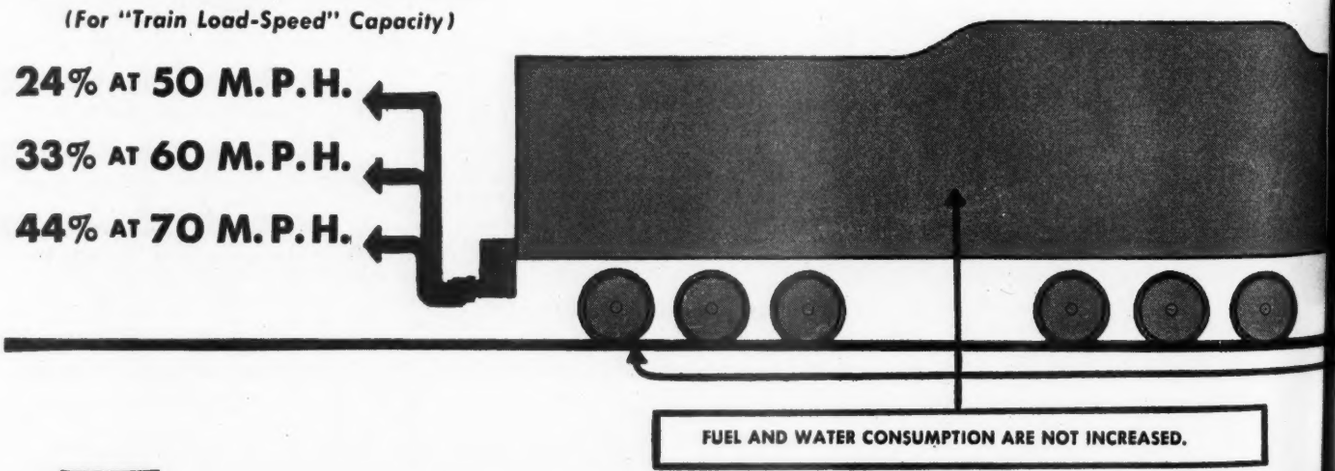
**INCREASED DRAWBAR HORSEPOWER**

*(For "Train Load-Speed" Capacity)*

**24% AT 50 M.P.H.**

**33% AT 60 M.P.H.**

**44% AT 70 M.P.H.**



**FUEL AND WATER CONSUMPTION ARE NOT INCREASED.**

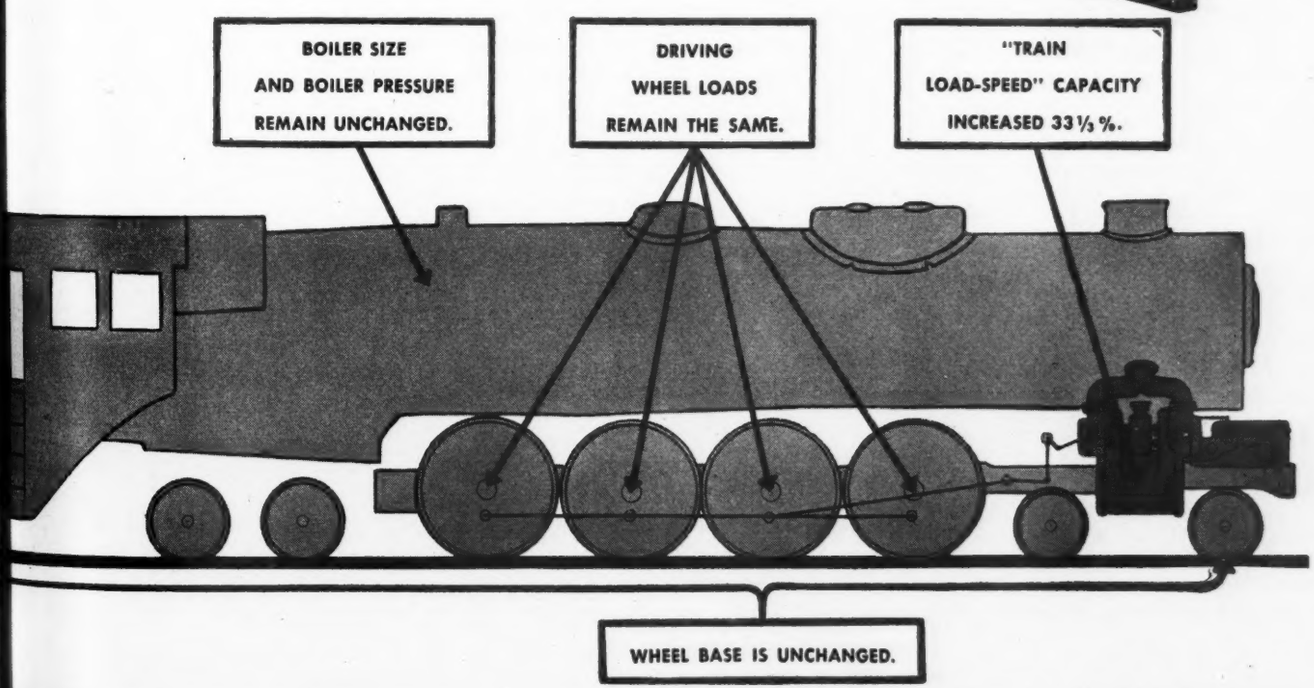
REG. U.S. PAT. OFF.

## FRANKLIN RAILWAY SUPPLY

In Canada: Franklin Railway

*"train load-speed" capacity*

# THE FRANKLIN SYSTEM of Steam Distribution

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Supply Company, Limited MONTREAL

inate state and local legal restrictions which hamper the war effort.

Secretary of Commerce Jesse Jones, as head of the federal government committee, called a joint meeting of the two committees for May 20, in the Conference Room of the Department of Commerce. At the closing session of the May 5-7 conference Governor Julius P. Heil of Wisconsin pointed out that many of the delegates did not have authority to take affirmative action against such restrictions and urged that a conference of all governors be called immediately.

Members of the federal committee in addition to Mr. Jones are the Secretary of the Treasury, the Attorney General, the Undersecretary of War, the Assistant Secretary of the Navy, the Chairman of the War Production Board, the Director of the Office of Price Administration, the Director of the Office of Defense Transportation and the Chairman of the War Manpower Commission.

## Air Service to Newfoundland

Trans-Canada Air Lines, an affiliate of the Canadian National, has extended its operations to include a daily round trip between Moncton, N. B., and St. John's, Newfoundland, making an intermediate stop at Sydney, N. S. Heretofore the only regular public transportation available between Newfoundland and the mainland has been by water. The time in transit by plane is less than five hours. Passengers, mail and express are carried.

## Would Extend Shipping Privilege to Canadian Ore Boats

Senator Reynolds, Democrat of North Carolina, and Representative Bland, Democrat of Virginia, respectively, have introduced S. 2539 and H.R. 7100, bills which would extend for the period of the present war and for six months thereafter the time within which vessels of Canadian registry may be permitted to transport iron ore on the Great Lakes between United States ports. The present law permits such transportation of iron ore during 1942.

## ODT Appointment

F. O. Terrill of Cincinnati, Ohio, has been appointed special assistant to Edward J. Buhner, chief of the Operations Section (Property Carriers), Division of Motor Transport, Office of Defense Transportation. Mr. Terrill's duties will involve over-the road transportation of food products by motor truck. He has been associated with the Trojan Grocery & Baking Company since 1930, and for several years has been in charge of purchasing, and operation and maintenance of highway transport equipment for that organization.

## Brotherhood of Clerks Wins Wage Boost from Forwarders

A wage increase of eight cents an hour has been awarded employees of three freight forwarding companies by government conciliation agencies, the award being handed down by Dr. Royal E. Montgomery, professor of labor-management relations at Cornell University. The award is retroactive to January 1. Companies affected are the Universal Carloading and Distributing Company, the National Carloading Corporation and the Acme Carloading Company. The latter, while not a party to the arbitration, agreed in advance to accept whatever settlement was made. The demand for increased wages was made five months ago by the Brotherhood of Railway Clerks.

## Colpitts Joins ODT Division of Railway Transport

Charles B. Colpitts, of New York, has been named associate director of the Office of Defense Transportation's Division of Railway Transport. He will be in charge of rail-truck coordination for the Eastern and Southern regions. Holly Stover, of Washington, D. C., has been appointed special assistant to V. V. Boatner, director of the Division.

Mr. Colpitts, who was formerly an engineer with Coverdale and Colpitts, will work with ODT's Division of Motor Transport, and with industry, to facilitate coordination of rail and truck operations. He will maintain headquarters in Washington. Mr. Stover, who will be assigned to special duties in the Division, has been a director and special executive of the Gulf, Mobile & Ohio, president of the Stover Smokeless Coal Company and of Holly Stover, Inc., and director of the Gulf Mining Company and the Sterling Smokeless Coal Company.

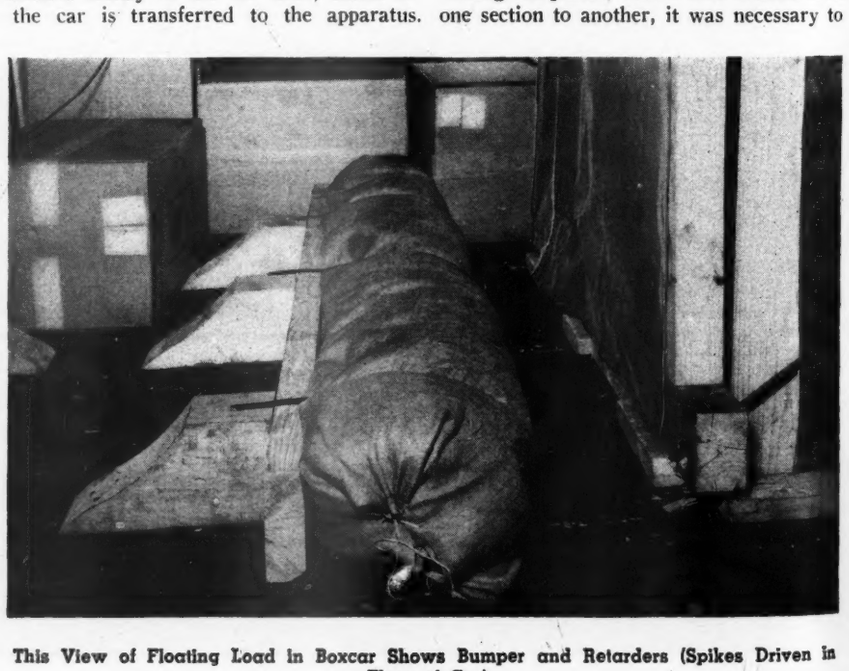
## "Floating Load" Is Used to Eliminate Shock in Shipping

The "floating load," a new solution to many diverse problems confronted in the shipping of a great variety of products, is being used by the General Electric Company in the shipment of steel mill control panels, rectifiers, motors, generator sets, furnaces, and most other equipment weighing from 5,000 lb. to 30,000 lb. loaded in box cars.

When a fragile piece of apparatus is blocked solidly to the car floor, shock to the car is transferred to the apparatus. With the floating load method the apparatus is merely placed on the car floor, not fastened to it, and is held in position by two bumpers, one at either end, and by side braces which are nailed to the floor to keep the load from weaving sideways. Then when the car is subjected to shock it is simply knocked out from under the load, and the railroad equipment rather than the apparatus receives most of the shock.

The method of preparing the car for the floating load is as follows: Sufficient room is left in each end of the car so that when the cars are coupled together in making up trains, the load has ample room to shift. An "excelsior cigarette" about 18 to 20 in. in diameter, made of excelsior rolled into a burlap, paper or cloth, is placed in each end of the car to serve as a cushion-like bumper. Where the load is short and placed in the center of the car, the bumpers are moved up to within about 3 ft. of the load, and car blocks are placed behind the bumpers to hold them in place. Side braces of 2 by 4 or 3 by 6 thickness, depending on the size of the load, are extended from one end of the load to the other and nailed to the floor to prevent the load from weaving sideways. In this manner, the car can be kept in balance. Where more than one unit is loaded in the car, to prevent one unit sliding a greater distance than another, the units are bound together by heavy-gage band-iron or heavy-gage wire to form a "unit floating load."

In loading pieces under 30,000 lb. it has been found that spikes, driven into the floor just ahead of the load at both ends of the car and projecting two or three inches above the floor, provide an excellent retarder. Steel mill control panels ranging from 10 to 40 ft. in length, consisting of several sections each approximately three ft. wide and of various heights, were formerly knocked down for shipment, and each section placed in a separate box. In wiring the panels, where wire crossed from one section to another, it was necessary to



**This View of Floating Load in Boxcar Shows Bumper and Retarders (Spikes Driven in Floor of Car)**

cut these wires and use a connection strip. A large number of these connections were used on each panel. When the unit floating load was developed and used for shipping panels, the cutting of the wires and use of connection strips was eliminated, and the panel shipped complete, resulting in a saving of time in tearing down the panel and in re-assembling it after delivery.

## L. I. Modernizes at New York

A modernized structural glass, metal trimmed ticket counter with twenty windows was opened on the Long Island concourse of Pennsylvania Station, New York, on May 21, as a part of the program for rearranging and "streamlining" the facilities of this terminal that has been under way for some time. In design and finish the new line of windows matches other additions and alterations that recently have been put in service. Scheduled for opening very soon is a new "Savarin" buffet adjoining the ticket windows and the waiting room.

## Army to Regulate Furloughs

The War Department has announced that in order to relieve congestion of week-end travel the Army will regulate furloughs so that the dates of departure and return to duty will come on Tuesdays, Wednesdays, and Thursdays. Also, furloughs and annual leaves will be scheduled throughout the 12 months of the year and not concentrated during the vacation months of July and August.

Recently, Joseph B. Eastman, director of Defense Transportation, issued an appeal calling for a spreading of the vacation load on the country's various forms of transportation.

## April Export Traffic

Cars of export freight other than grain or coal unloaded at Atlantic, Gulf and Pacific ports in April this year totaled 74,061 cars compared with 50,262 in April, 1941, according to the Association of American Railroads.

Cars of grain for export unloaded in April this year at these ports totaled 3,217 cars compared with 5,333 cars in the same month last year.

"This traffic is being handled without congestion or delay, due to the continued cooperation of all concerned, particularly the steamship lines, exporters and shippers," the A. A. R. said.

## Pullman Opposed to Delay in Anti-Trust Suit

Directors of Pullman, Inc., are opposed to any delay in the trial of the government's anti-trust suit against the company and its affiliates, according to David A. Crawford, president, in his report to stockholders for the first quarter of 1942. His statement was occasioned by the establishment by President Roosevelt of a board of cabinet members to pass upon proposals to defer suits under anti-trust laws brought against companies engaged in war work.

"The directors have decided it would be inadvisable to ask for 'duration deferment' in the suit against the Pullman group and prefer to proceed with the trial of the case while the evidence that has been introduced is fresh in the minds of the hearing judges and while the railroad and Pullman officers, who are conversant with the facts, are still here and able to testify," Mr. Crawford said. "A temporary deferment of the activities of the department of justice would not remove the intolerable interferences with the normal contracting processes and the necessary forward-looking preparation to carry on the business of the subsidiaries."

The suit against the Pullman group was filed in Philadelphia last October. The case was heard briefly in Philadelphia during November and was adjourned this year.

## Carriers Will Cease Soliciting Convention Traffic

Interstate Commerce Commissioner J. Monroe Johnson has written a letter to J. J. Pelley, president of the Association of American Railroads, in which he asks why the railroads are continuing to solicit and develop convention business in view of the present alleged shortage of passenger equipment and the efforts of the Office of Defense Transportation to alleviate the situation.

Mr. Pelley has replied, saying that in the event that any of the railroads have been encouraging conventions, they will agree to stop this practice.

## Women "Soldiers of Production" in A. C. F. Tank Plant

For the second time in the company's history—almost a hundred years—women are now being employed at an American Car & Foundry Co. plant, which is turning out light combat tanks "at an unbelievable rate." During world war I, women were used in the art of camouflage on gun mounts and other war equipment. Now they are working side by side with men on the automatic machines in the machine shop where the light tanks are building and in the armor plate factory where red-hot slabs of metals are drawn from the heat-treating ovens and placed in vats of boiling oil.

## I. C. C. Authorizes New All-Rail Coal Route

New freight rates have been authorized by the Interstate Commerce Commission which will provide another all-rail route from the southern Appalachian mines to help the railroads meet the Atlantic Coast states' fuel problem, according to an announcement on May 15 by Solid Fuels Coordinator Harold L. Ickes.

Mr. Ickes also said that the railroads are studying the possibility of increasing shipments from southern Appalachian mines into New England via still another new route not yet authorized. "This contemplated route," he pointed out, "would offer increased use of water transportation, which would reduce the length of the equipment-consuming long rail hauls on much coal that otherwise would be transported all-rail from mines in Virginia and southern West Virginia into New England."

The establishment of the new all-rail route for which freight rates were authorized will enable mines along the Virginian in Virginia and West Virginia to ship coal via that road across the Chesapeake Bay car ferry to Cape Charles, Va., and thence up the eastern seaboard over the Pennsylvania's lines. This, it was noted, will enable the roads to relieve the congested Washington and Baltimore areas of railroad traffic to the extent of the amount of coal that can be shipped into seaboard states over the new all-rail route.

## Freight Car Loading

Loading of revenue freight for the week ended May 16 totaled 839,052 cars the Association of American Railroads announced on May 21. This was a decrease of 201 cars, or 0.02 of one per cent, below the preceding week; a decrease of 21,750 cars, or 2.5 per cent, below the corresponding week in 1941, but an increase of 159,987 cars, or 23.6 per cent, above the same week in 1940.

As reported in last week's issue, loadings of revenue freight for the week ended May 9, totaled 839,253 cars, and the summary for that week, compiled by the Car Service Division, A. A. R., follows:

**Revenue Freight Car Loading**

For Week Ended Saturday, May 9

| District | 1942 | 1941 | 1940 |
|---|---|---|---|
| Eastern | 161,628 | 178,697 | 144,273 |
| Allegheny | 187,523 | 187,874 | 142,182 |
| Pocahontas | 57,012 | 57,006 | 48,882 |
| Southern | 124,827 | 114,901 | 100,127 |
| Northwestern | 133,912 | 136,311 | 103,673 |
| Central Western | 110,545 | 113,751 | 96,482 |
| Southwestern | 63,806 | 48,609 | 45,009 |
| Total Western Districts | 308,263 | 298,671 | 245,164 |
| Total All Roads | 839,253 | 837,149 | 680,628 |
| Commodities | | | |
| Grain and grain products | 35,145 | 35,118 | 32,224 |
| Live stock | 11,698 | 12,193 | 11,493 |
| Coal | 167,809 | 139,056 | 118,837 |
| Coke | 14,316 | 12,855 | 8,008 |
| Forest products | 50,618 | 40,567 | 33,351 |
| Ore | 866,800 | 78,400 | 51,651 |
| Merchandise l.c.l. | 98,433 | 162,887 | 149,047 |
| Miscellaneous | 374,434 | 356,073 | 276,017 |
| May 9 | 839,253 | 837,149 | 680,628 |
| May 2 | 858,904 | 794,299 | 665,547 |
| April 25 | 861,353 | 721,627 | 644,804 |
| April 18 | 846,562 | 708,793 | 628,468 |
| April 11 | 814,233 | 679,808 | 619,105 |
| Cumulative Total, 19 Weeks | 15,201,680 | 13,812,063 | 12,011,917 |

Carloadings for the week ended May 9 totaled 66,690, as compared with 66,126 in the previous week and 61,566 in the corresponding week last year, according to the tabulation of the Dominion Bureau of Statistics.

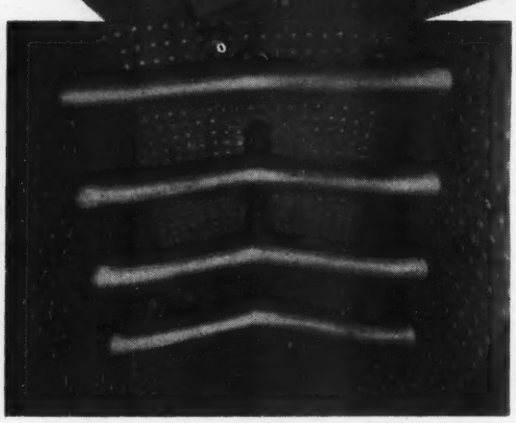
| | Total Cars Loaded | Total Cars Rec'd from Connections |
|---|---|---|
| Total for Canada: | | |
| May 9, 1942 | 66,690 | 31,725 |
| May 2, 1942 | 66,126 | 32,985 |
| Apr. 25, 1942 | 63,802 | 32,723 |
| May 10, 1941 | 61,566 | 29,966 |
| Cumulative Totals for Canada: | | |
| May 9, 1942 | 1,178,113 | 607,165 |
| May 10, 1941 | 1,053,896 | 547,118 |
| May 11, 1940 | 910,320 | 465,346 |

## ODT Asks Mid-Week Vacation Travel

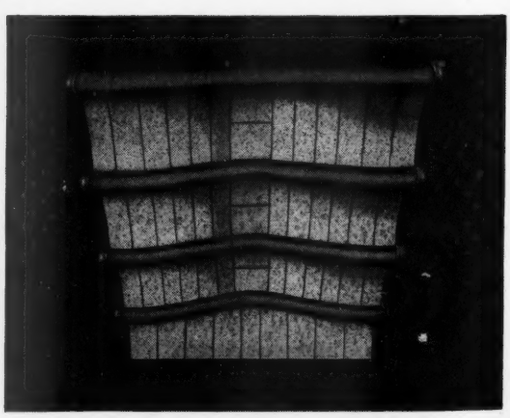
The Office of Defense Transportation has requested the United States Chamber of Commerce, the American Bankers' Association, and the Institute of Life Insurance to ask member organizations to aid in relieving week-end travel demands on

*Continued on second left-hand page*

# Security Circulators



View illustrating the positioning of Security Circulators in an average size of locomotive firebox prior to installing the brick arch.



Typical Security Circulator and brick Arch Installation in a locomotive firebox. The small sectional brick are as readily applied as in an ordinary arch tube firebox.

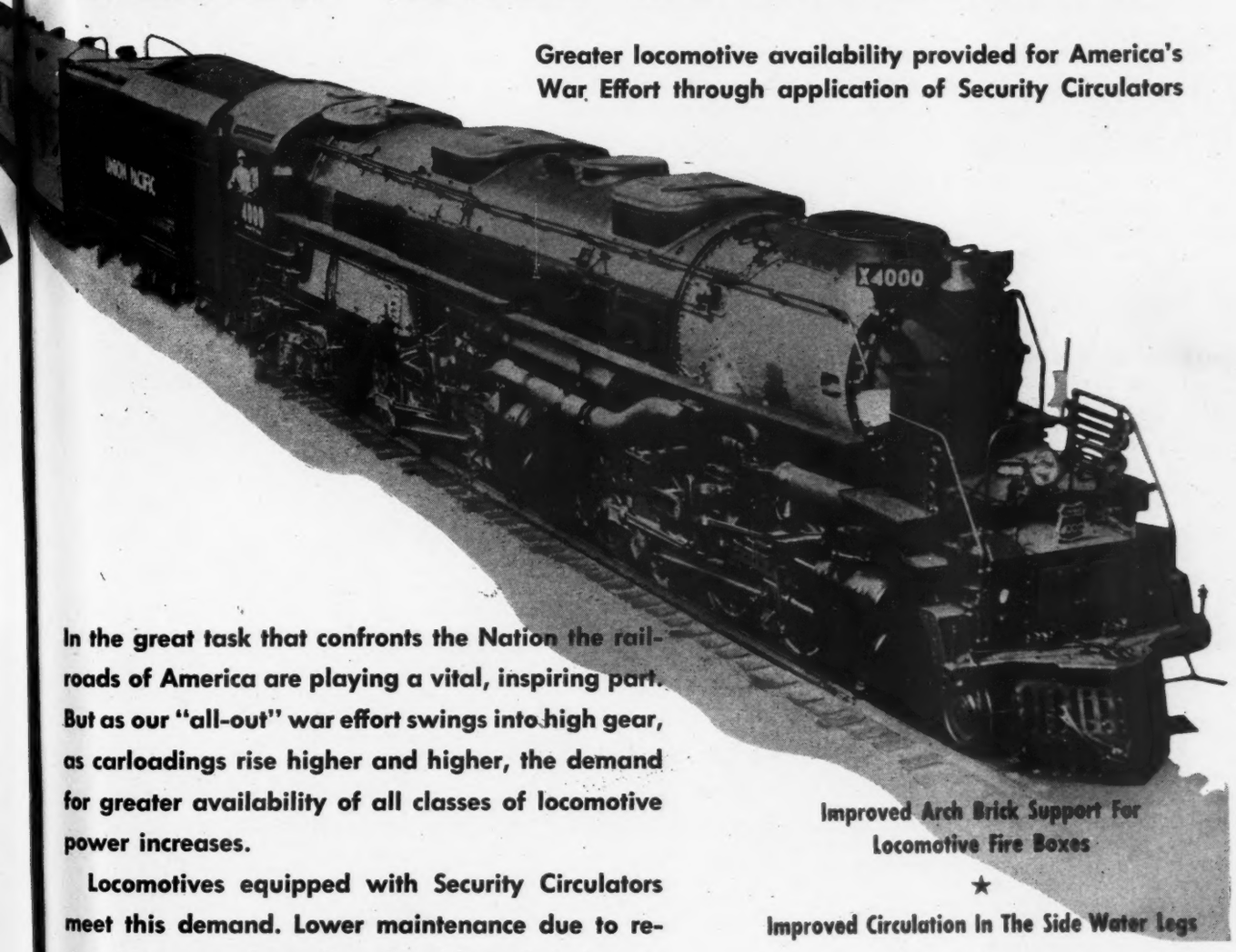
AMERICAN ARCH

*Security Circulator Division*

★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★

# "KEEP 'EM ROLLING"

**Greater locomotive availability provided for America's War Effort through application of Security Circulators**




**In the great task that confronts the Nation the railroads of America are playing a vital, inspiring part. But as our "all-out" war effort swings into high gear, as carloadings rise higher and higher, the demand for greater availability of all classes of locomotive power increases.**

**Locomotives equipped with Security Circulators meet this demand. Lower maintenance due to reduced honeycombing, flue plugging and cinder cutting, plus increased brick arch life mean less time spent in the shop for repairs — thus providing more ton-miles per locomotive.**

**Improved Arch Brick Support For Locomotive Fire Boxes**

★

**Improved Circulation In The Side Water Legs**

★

**Reduced Honeycombing And Cinder Cutting**

★

**Lower Cost of Boiler Maintenance**

COMPANY, INC.

NEW YORK CHICAGO

the railroads and bus lines by scheduling mid-week departure and return of employees who plan vacation trips.

In letters addressed to these organizations, ODT called attention to Director Joseph B. Eastman's recent appeal to all government agencies to arrange for annual leaves to begin and terminate on Tuesdays, Wednesdays, and Thursdays, and to spread vacations over the entire year rather than concentrate them in the months of July and August.

At the same time Mr. Eastman announced that he had written Judge Kenesaw M. Landis, Commissioner of Baseball, asking that the various clubs under his jurisdiction consider changing the starting times of their games as an aid to the war transport conservation program.

## April Operating Revenues 48.9 Per Cent Above 1941

Preliminary reports from 88 Class I railroads, representing 82.1 per cent of total operating revenues, made public today by the Association of American Railroads, show that those roads, in April, had estimated operating revenues amounting to $458,632,597, compared with $307,978,405 in the same month of 1941, or an increase of 48.9 per cent.

Freight revenues of the 88 roads in April, amounted to $375,345,307 compared with $250,519,676 in April, 1941, or an increase of 49.8 per cent. Passenger revenues totaled $52,899,655, compared with $31,418,233 in April, 1941, or an increase of 68.4 per cent.

## A. A. R. Establishes Passenger Car Section

"To help increase the capacity of railroads for handling passenger traffic," J. J. Pelley, president of the Association of American Railroads, on May 19 announced the establishment of a Passenger Car Section of the Car Service Division. Edwin F. Bilo, who has been assistant to the chairman of the Car Service Division, has been appointed manager of the new section.

The principal function of that Section will be to work with railroads "in order to obtain the greatest practical efficiency in the use and handling of passenger train equipment." The Section from time to time also will conduct studies as to passenger train travel and operation in all parts of the country.

The headquarters of the Passenger Car Section will be in the Transportation Building, Washington, D. C.

## Nelson Names Resources Protective Board

A Resources Protection Board which will evaluate the relative wartime importance of all plants and natural resources and make recommendations for their protection has been appointed by Donald M. Nelson, chairman of the War Production Board. Facilities to be thus evaluated embrace "all plants, installations, including factories, shipyards, railroads and communications networks, and mines and other natural resources."

The Board will be headed by William K. Frank of WPB's Production Division, and it will "cooperate with the Army and Navy, the Maritime Commission, and Office of Civilian Defense in furnishing ratings and recommendations by which they may be guided in planning the protection of resources." The hazards to be considered "will include bombing, sabotage, espionage or actual invasion, as well as natural hazards such as fire and flood."

## Record Lake Ore Shipments

Iron ore shipments this year on the Great Lakes up to May 1 reached a new all-time high of 8,581,740 gross tons, according to the War Production Board. This tonnage represents an increase of 1,626,947 tons, or 23.9 per cent, over the same period in 1941.

"Because of the vital importance of Great Lakes shipping to the continued full production of iron and steel, every effort is being exerted to move the maximum amount of ore down from Lake Superior this year," the WPB statement said. "The 1942 goal is 89,500,000 tons, as compared to a normal movement of 50 million tons."

Meanwhile, the Office of Defense Transportation announced on May 15 that all grain traffic over the Great Lakes in vessels capable of carrying iron ore ceased on that day, as ODT General Order No. 8 became effective, and placed some 340 ships with 3,000,000 tons of cargo space under control of ODT Director Eastman.

Provisions have been made in the order for permits to allow vessels whose cargo space is not suited to the ore trade to haul grain and other commodities. The number of these mixed carriers is very small, it was pointed out. The order gives Mr. Eastman the right to determine whether any vessel in the lakes traffic is capable of handling ore cargo.

## Western Railway Club Holds Annual Dinner

The fifty-eighth annual dinner of the Western Railway Club was held Monday evening, May 18, at the Hotel Sherman, Chicago, and was presided over by President W. W. Kelly, general purchasing agent, Atchison, Topeka & Santa Fe. Following the dinner, J. L. Beven, president, Illinois Central, introduced the principal speaker, Honorable Dwight H. Green, Governor of Illinois, who paid tribute to transportation as a vital part in every detail of the national war effort and credited the railroads with commendable foresight and initiative in developing plans to meet the transportation emergency in the way it has been met to date.

At the conclusion of the governor's remarks the following officers were elected for the ensuing year: President, C. M. House, superintendent motive power and equipment, Alton; first vice-president, W. L. Fox, general superintendent, Belt Railway of Chicago; second vice-president, R. D. Long, general purchasing agent, Chicago, Burlington & Quincy; treasurer, J. W. Fogg, vice-president, MacLean-Fogg Lock Nut Company; and executive secretary, E. E. Thulin, E. E. Thulin Company.

Directors-elect included the following: J. M. Nicholson, mechanical assistant to vice-president, A. T. & S. F.; C. L. Emerson, division master mechanic, C. M. St. P. & P.; L. L. White, chief operating officer, C. & N. W.; T. D. Beven, vice-president, E. J. & E.; A. N. Laret, assistant chief purchasing officer, St. L.-S. F.; C. L. Wakeman, general storekeeper, Wabash; Fred Alger, Pullman-Standard Car Manufacturing Company; R. A. Carr, Dearborn Chemical Company; Ernest Kuehn, Electro-Motive division, General Motors Corporation; John McCormick, General Steel Castings Corporation; G. A. Murphy, Magnus Metal Corporation; and C. B. Armstrong, Air Reduction Sales Company.

The following are newly-elected members of the Nominating committee: A. C. Mann, vice-president, Illinois Central; H. H. Urbach, mechanical assistant to executive vice-president, C. B. & Q.; A. F. McSweeney, superintendent freight transportation, Pennsylvania; John English, Carnegie-Illinois Steel Corporation; J. E. Long, Franklin Railway Supply Company; and R. J. Van Meter, Superheater Company.

## ODT Authorizes Substitution of Motor Service for Trains

Director Eastman of the Office of Defense Transportation has authorized the Northern Pacific to substitute bus and truck service for mail-express-passenger trains over the 71-mile route between Logan, Mont., and Butte. The authorization was contained in Supplementary Order No. 2-1, the first to be issued under General Order No. 2 which became effective April 1, and which prohibits the substitution of buses for train or street-car service on existing rail routes.

The N. P. application for permission to make the substitution stated that the road cramped for passenger equipment to meet through-service requirements, and that experiments on the Logan-Butte route indicated that motor vehicle equipment would render prompt and efficient service. The railroad pointed out that it already owned the necessary buses and trucks, and that the substitution would release two Pacific-type passenger locomotives and a number of passenger-train cars for use in through service.

The supplementary order provides that the effective date shall be the effective date "of an order or orders, if any, issued by appropriate regulatory authorities, authorizing the abandonment of such rail service."

## WPB Considers Nationwide Gasoline Rationing

Nationwide gasoline rationing as a means of conserving rubber is now under consideration by the War Production Board. It has been learned that the Board at its last meeting delegated to the Office of Price Administration the task of working out a plan for nationwide gasoline rationing in conjunction with the Office of Defense Transportation and the Office of Petroleum Coordinator.

This development came at the same time that President Roosevelt declared at his May 19 press conference that the gasoline shortage on the east coast should be

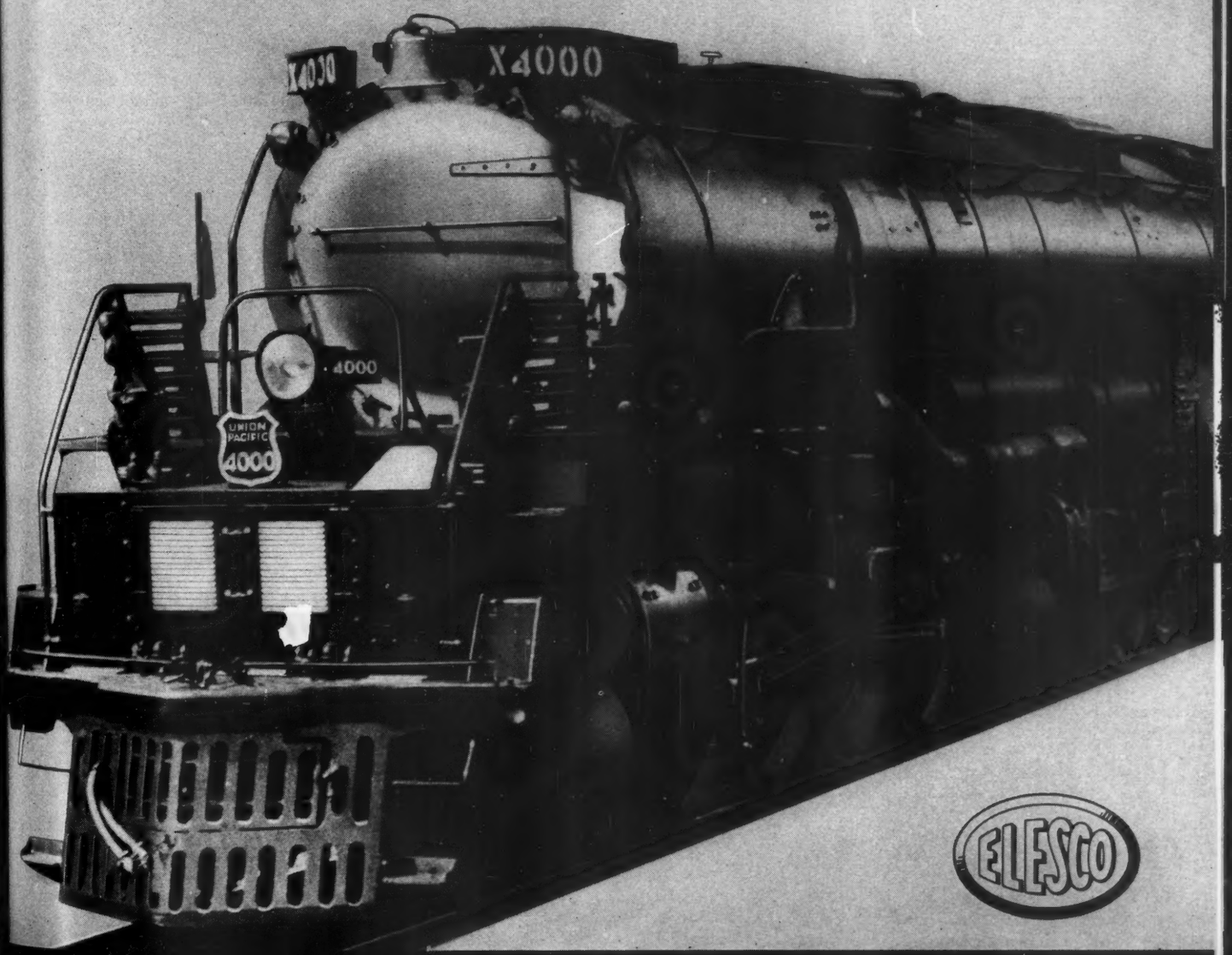
*Continued on next left-hand page*

# For the *Real* TOUGH JOB
# UNION PACIFIC Chose S T E A M

**Their 20 new steam locomotives, unassisted, will each haul long freight trains over the high Wasatch mountain ranges; their investment cost is ⅓ that of locomotives powered with internal-combustion engines.**

**Each locomotive will develop 7000 hp. and generate 125,000 lb. of steam an hour . . . due in no small measure to ELESCO Type E Superheaters, Type TP Exhaust Steam Injectors, Tangential Steam Dryers and American Multiple Valve Throttles.**

***Keep Abreast . . . with ELESCO.***

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treated as a national rather than as a regional problem.

Meanwhile, the Brookings Institution has made public a survey in which it reaches the conclusion that "drastic and immediate gasoline rationing on a nation-wide basis, designed to conserve tires rather than gasoline, offers the only reasonable prospect of averting a breakdown in essential automobile transportation."

The survey, entitled "Automobile Transportation in the War Effort," was made by Charles L. Dearing. It estimates that, if normal driving habits continue, the supply of tires will not be sufficient to meet essential requirements by the middle of 1943, and will be completely exhausted by 1945. This estimate is based on a calculation that 20,000,000 passenger cars are needed to maintain the civilian economy without serious disruption.

## ODT to Check Carload Freight Bills

A nationwide check on all carload freight billed and forwarded from each station on the nation's railroads on a given date was announced on May 21 by the Office of Defense Transportation.

Joseph B. Eastman, ODT director, set Wednesday, May 27, as the date on which the railroads are required to furnish his office with complete copies of waybills on all carload freight originating on their lines on that day. As a result of this study, Mr. Eastman said, ODT will be better able to effect continuous adjustments between the nation's transportation requirements and the transportation services available.

The check, Mr. Eastman continued, will provide a basis on which the war production board may certify priorities, if necessary, in the transportation of materials, articles, fuel, and other commodities among military, economic defense, defense aid and civilian defense demands. In addition, he concluded, with the information available from each waybill, ODT will be able to determine the volume, origin, flow, and destination of each principal article moving in commerce and the extent of freight commodity cross hauls and circuitous hauls.

## Equipment on Order

Class I railroads had 985 new locomotives on order on May 1, according to the Association of American Railroads. Of that number 408 were steam and 577 were electric and Diesel-electric.

On April 1, they had 930 new locomotives on order which included 426 steam and 504 electric and Diesel-electric. Locomotives on order on May 1, 1941, totaled 438, of which 211 were steam and 227 were electric and Diesel-electric.

Railroads in the first four months of 1942 installed 237 new locomotives of which 96 were steam and 141 were electric and Diesel-electric. In the same period in 1941, they put in service 159 which included 37 steam and 122 electric and Diesel-electric.

Class I roads put in service 10,478 new freight cars in April, which brought to 37,741 the total number installed in the first four months of this year, there having been 9,858 in March, 9,262 in February and 8,143 in January. In the first four months of 1941 the railroads put 28,284 new freight cars in service.

Of the total number installed in the four months' period this year, there were 26,089 box, 10,394 coal, 205 refrigerator, 765 flat, and 288 miscellaneous freight cars.

New freight cars on order on May 1, totaled 59,328 compared with 69,515 on April 1 this year, and 56,502 on May 1, 1941. Class I roads had on order on May 1 this year 27,172 box, 26,885 coal, 2,942 flat, 1,199 refrigerator, 300 stock, and 830 miscellaneous freight cars.

## Atlantic Coast "Dimout" May Hit Yard Floodlights

Floodlighting of railway yards and terminals along the Atlantic coast may be severely restricted as a result of recent Army orders requiring the elimination of sky glow in that region. This measure is a part of a general "dimout" program put into effect all along the shore in a zone some fifteen miles deep.

Aimed particularly at large cities, as well as shore resorts, the order effects a virtual elimination of lighted outdoor advertising signs, blacks out high buildings, and materially cuts down street and highway lighting within the affected area. All lights visible from the sea must be shielded or hooded, and floodlights and high power arcs must either be cut out or effectively dimmed or screened, because the glow from such sources silhouettes ships off shore and makes them easy targets for enemy submarines.

No satisfactory means has been found as yet to eliminate reflection from the concentrated illumination at industrial plants, shipyards, piers, railway yards and other locations where outdoor work essential to the war effort is in progress around the clock. It is reported that military authorities are determined to reduce this glow, particularly in the area surrounding New York harbor, where its intensity is greatest, even though they recognize the effect that policy may have on the efficient operation of many facilities. Pending a clarification of military policy essential lighting of railway facilities continues, though shields and screens have been employed in many instances in an effort to reduce the reflection.

## Cunningham and Bigham Leave Transport Board Staff

Professor William J. Cunningham has resigned as director of the Transportation Board of Investigation and Research's study of the relative economy and fitness of the various modes of transportation, while Dr. Truman C. Bigham has resigned as secretary of the Board. Separate announcements of the foregoing came from the Board on May 19, the statement with respect to Professor Cunningham saying that he would "continue to be available to the Board as Special Consultant."

That announcement in full was as follows: "The Board of Investigation and Research—Transportation today announced that the increased military importance of Professor Cunningham's summer courses in the Harvard School of Business Administration will make it impossible for him to devote his full time to the work of the Board during the coming summer as originally planned. It has therefore become necessary for Professor Cunningham to withdraw as director of the Board's studies of relative economy and fitness of carriers, effective May 20, 1942. The Board is glad to announce that Professor Cunningham will continue to be available to the Board as Special Consultant."

The statement announcing the resignation of Dr. Bigham said: "The Board of Investigation and Research—Transportation announced today the resignation of Dr. Truman C. Bigham as Secretary of the Board, effective May 16, 1942."

Later in the week Dr. Bigham issued the following statement: "My resignation as secretary of the Board of Investigation and Research, dated May 16, 1942, effective immediately, was submitted in order to enable me to expedite the completion of a manuscript under contract for publication."

Professor Cunningham, whose career was reviewed in the *Railway Age* of March 7, page 508, when his appointment to the Board's staff was announced, is the James J. Hill Professor of Transportation at Harvard's Graduate School of Business Administration. Dr. Bigham, whose career was reviewed in the issue of October 25, 1941, page 682, came to the Board from the University of Florida where he was professor of economics.

## Barriger Explains ODT's Position on T. P. & W.

The position of the Office of Defense Transportation in regard to the current labor arbitration proceedings on the Toledo, Peoria & Western was made known on May 15 by John W. Barriger, federal manager of the road, when he was asked about a report that Judge Hilliard, as arbitrator for the National War Labor Board, had recessed the proceedings until May 25 to give the ODT an opportunity to study a proposed wage and working agreement.

Mr. Barriger explained that organized railroad labor had submitted, on May 6 or 7, a schedule of wages and working conditions and that his office had asked for an opportunity "to see how this schedule would work out on the railroad." The ODT, he continued, proposed to apply the schedule to a month's operation of the road through the use of a double payroll system, having one payroll apply to actual operations and the other based on the proposed new schedule.

He went on to explain that operations on the T. P. & W. in April were comparatively light and, for that reason, the ODT suggested the application of the double payroll plan of study to the May operations. Judge Hilliard, he added, had given the ODT until May 25 to complete its study of the comparative cost of operation under the present and proposed schedules of wages and working conditions.

Mr. Barriger also made it clear that the ODT was not submitting "any views at all" with respect to the labor controversy. All that that organization wanted to do, he declared, was to ascertain what effect the schedule proposed by the railway labor

*Continued on fifth right-hand page*

# RAILROADS *Vital* FOR WAR

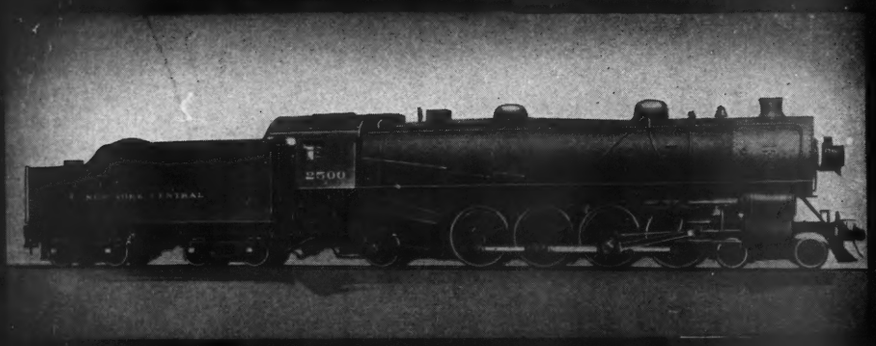
NORTHERN PACIFIC
YELLOWSTONE PARK LINE

"TRANSPORTATION plays a peculiarly vital part in the war effort. It enters into modern production at every stage, from the time the raw materials leave the ground until the finished product reaches its final destination. Troops and munitions would be useless without transportation, and so would the workers in our great new war-production plants. No one who gives a moment's thought to the matter can possibly doubt that, of all the indispensable parts of the war effort, transportation is the most extensive and pervasive."

Joseph B. Eastman
Director — Office of
Defense Transportation

AMERICAN LOCOMOTIVE
Manufacturers of Mobile Power
Diesel and Electric Locomotives, Marine Diesels, Tanks, Gun Carriages and other Ordnance

# *Great Power* SPEEDING V

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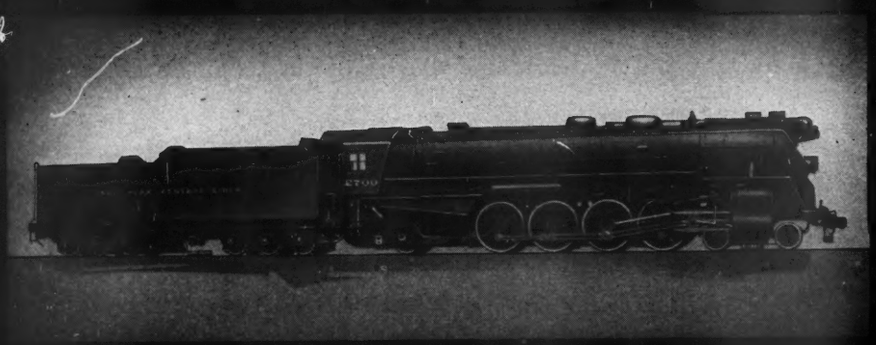


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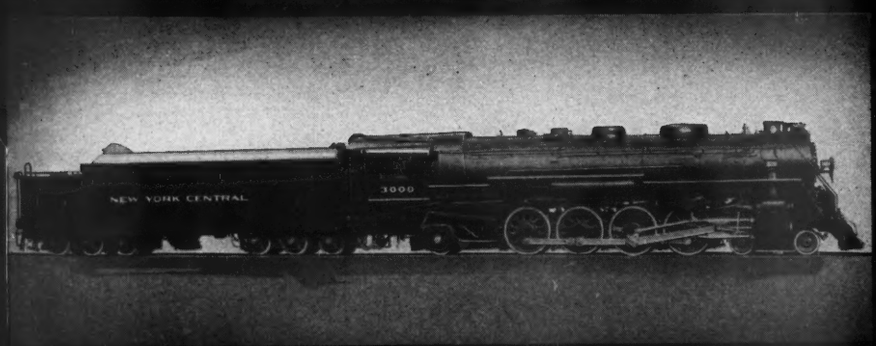



1940

*Now*

# VICTORY TRANSPORTATION

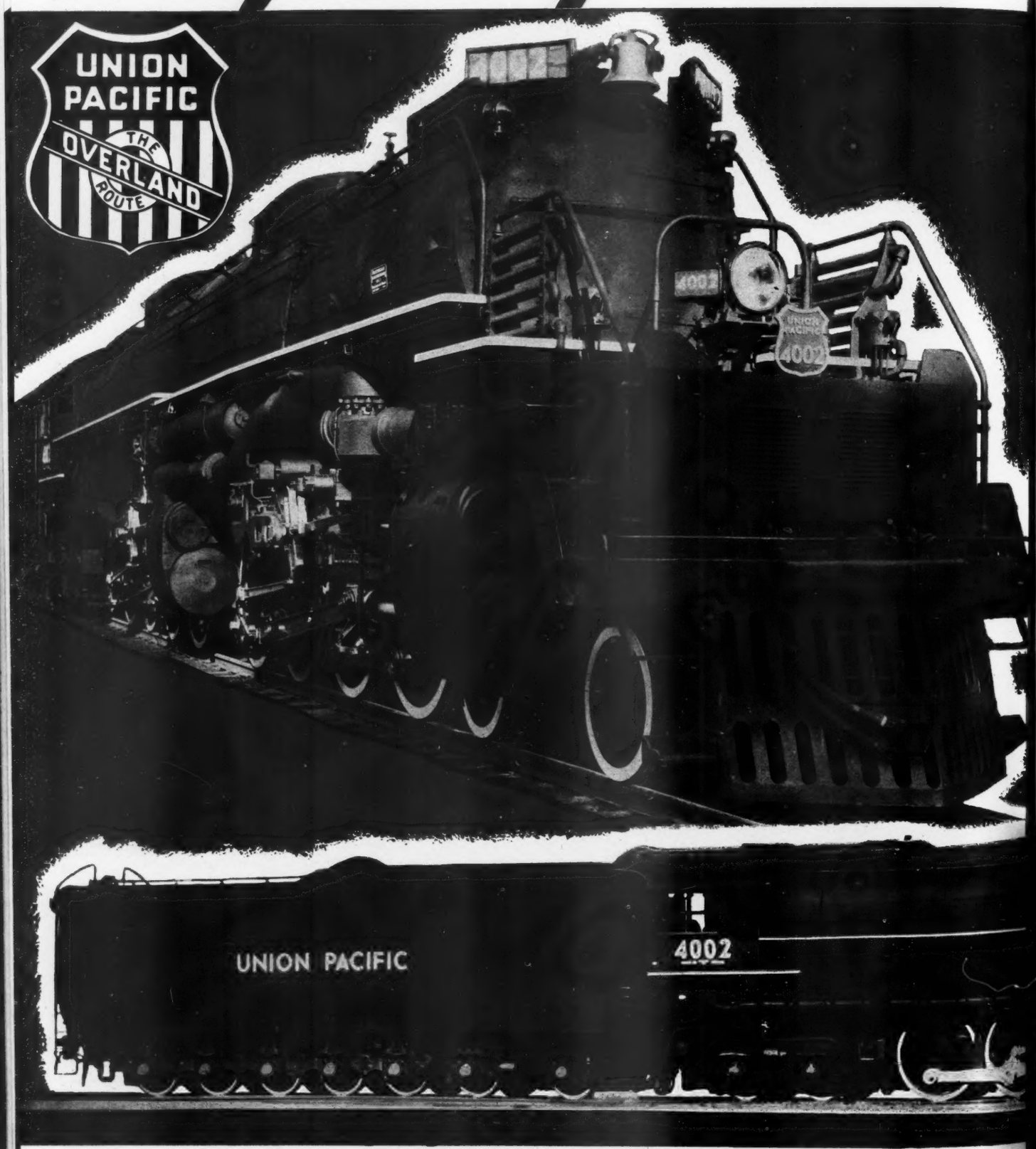
## NEW YORK CENTRAL 4-8-2

**A great and powerful fleet of New York Central freight locomotives are operating on the transportation front delivering to Uncle Sam and the nation that fast dependable 20th Century Freight Service for which the Central is famous.**

**For twenty-six years, the Alco 4-8-2 type locomotive has been delivering exceptionally fine performance in high speed freight service, and to date 385 Alco locomotives of this wheel arrangement have been delivered to the New York Central. Each new series was better and better than its predecessor, incorporating improvements which have increased capacity — speed — efficiency and serviceability.**

**The latest locomotives are constructed to operate at 80 miles per hour, and develop a cylinder horsepower of approximately 4400 at 50 miles per hour. High horsepower output in the high speed range permits heavier train loads at fast speeds and there is always a big margin of power available for additional cars.**

# "Big Boy" LEADS U



# UNION PACIFIC FLEET

## 4-8-8-4

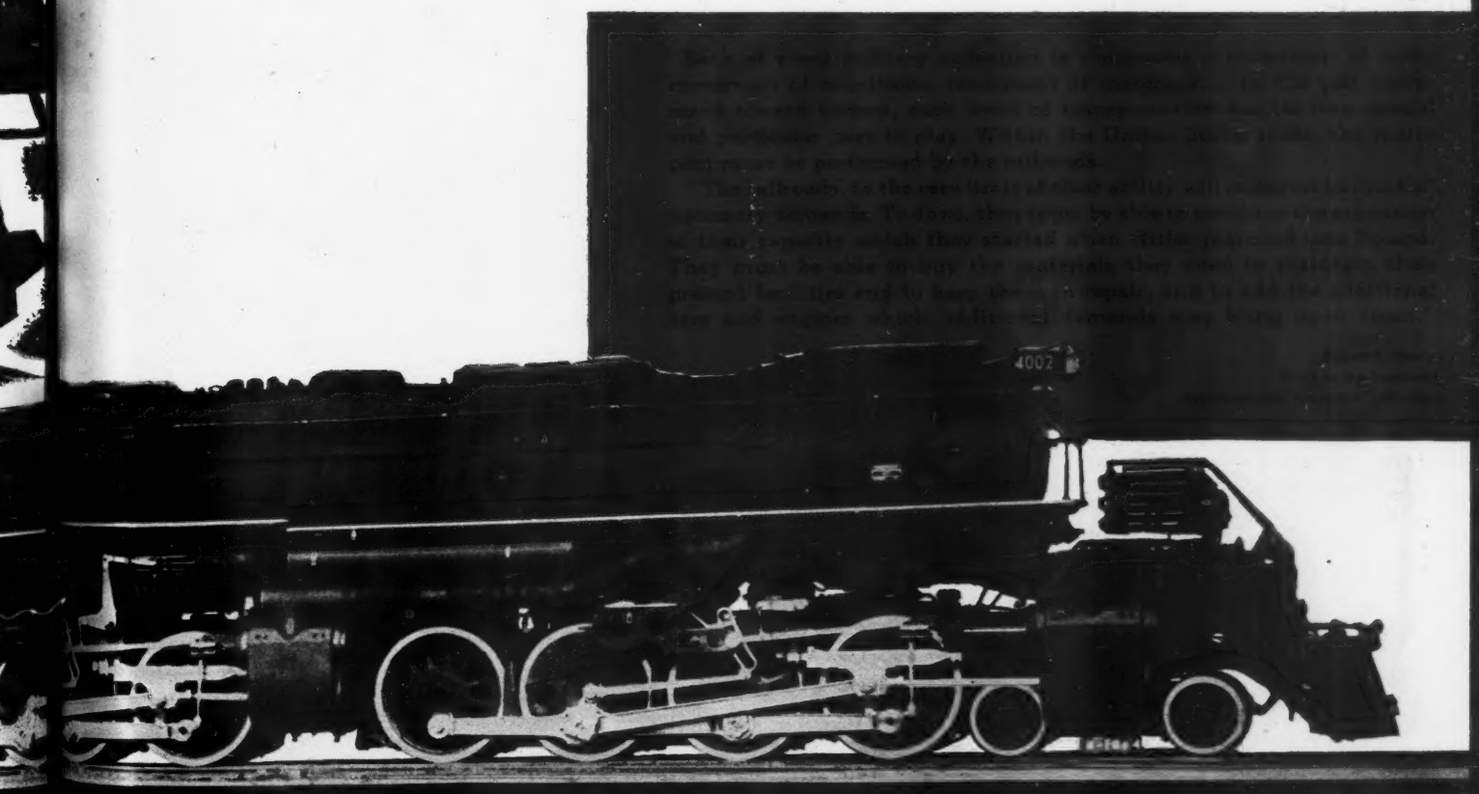
UNION PACIFIC

**Union Pacific says "More Power to America's Victory Program" with "Big Boy" — the world's largest and most powerful steam locomotive.**

**Not just one, but twenty of these gigantic locomotives have been placed in fast freight service in the mountainous western territory of the Union Pacific —"The Strategic Middle Route" to and from all the West.**

**"Big Boy" can operate on any part of the Union Pacific. Capable of speeds up to 80 miles per hour, these locomotives can deliver maximum power output continuously at 70 miles per hour. They will haul maximum tonnage and maintain schedules without helper service on the Wahsatch Mountains on a ruling grade of 1.14 per cent between Ogden, Utah, and Green River, Wyoming.**

**"Big Boy" is the latest addition to a long line of illustrious predecessors, designed to give in fullest measure the most efficient service.**




AMERICAN LOCOMOTIVE

Manufacturers of Mobile Power

# Wartime Tempo ON THE "The D&H"

# HE DELAWARE AND HUDSON

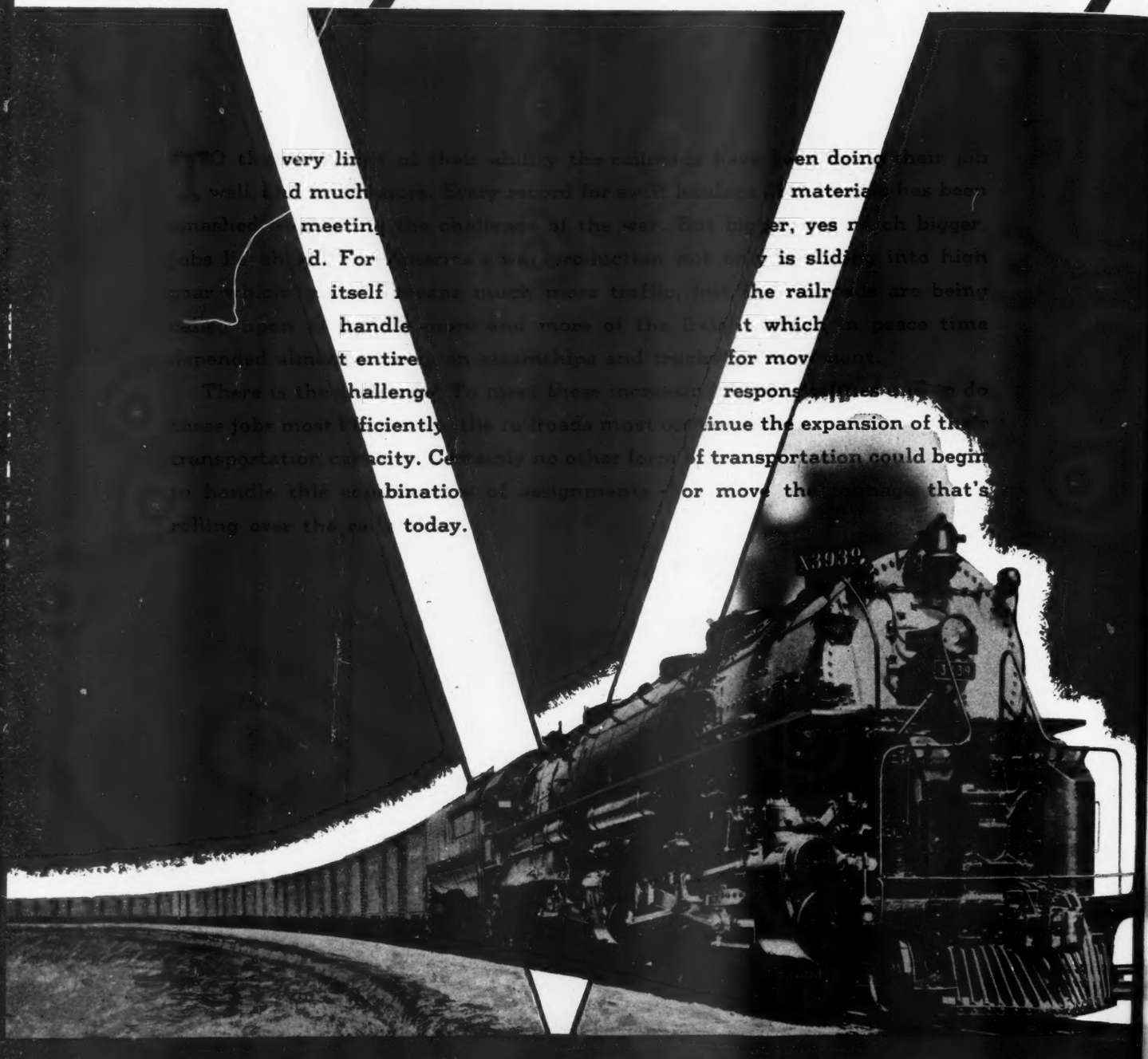
## DELAWARE AND HUDSON 4-6-6-4

**With twenty of these high powered articulated freight locomotives already in service the Delaware and Hudson is speeding Victory transportation with fast dependable service to the South, West and to Canada and New England. When the fifteen more on order are delivered this fast service will be stepped up and expanded still further. These new locomotives are handling increased tonnage, have eliminated double heading of freight trains, and are delivering a more efficient service with faster schedules to shippers in this country and Canada.**

**This modern Alco 4-6-6-4 articulated type locomotive has won nationwide approval for its ability to handle heavier freight trains at higher speeds and with reduced maintenance. Alco to date has delivered or has on order, 188 of these locomotives for the Union Pacific; Northern Pacific; Spokane, Portland and Seattle; Delaware and Hudson; Western Pacific and the Clinchfield.**

# THE RAILROADS ARE DOING THEIR JOB AND MORE ★ ★ ★

# *Rolling 'Em to Victory*



AMERICAN LOCOMOTIVE COMPANY

*Railway Steel Spring Division*

30 CHURCH STREET, NEW YORK, N. Y.

unions would have on the cost of operation of the road. He concluded his statement by saying that the ODT would submit to the arbitrator the information which it obtained in carrying out its cost study.

Meanwhile, rail labor representatives have accused Mr. Barriger and the ODT of "unnecessarily delaying the settlement of the dispute" on the T. P. & W. by asking for a month's delay in the proceedings.

## Grain Shipments Restricted

Shipments of all kinds of grain to all markets were restricted beginning May 20 under Embargo No. 40 issued by the Car Service Division of the Association of American Railroads. The restrictions were established because of congested grain storage facilities.

Explaining the action in a May 18 statement, Warren C. Kendall, chairman of the Car Service Division, said that it was taken on the recommendation of grain storage committees after a series of recent conferences in the grain producing areas. These committees, created at the suggestion of the United States Department of Agriculture, are composed of milling and grain trade representatives, including both independent and cooperative country and terminal operators, and railroads and agencies of the Department of Agriculture.

For the present, only grain intended for storage will be affected by this restriction. Grain shipped to any market for sale will be handled as usual, but cars will not be provided for grain to be stored unless assurance can be given that they will be unloaded promptly at destination.

"The handling of this year's grain crop is a problem of storage and not of transportation," Mr. Kendall said. "There will be cars for the movement of every bushel of grain which can be unloaded promptly. The limit is in grain storage space, already nearly filled with the carry-over from previous crops. The restriction now being put into effect upon the recommendation of the grain storage committees is to prevent freight cars being tied up for storage of grain or any other commodity, and to keep them liquid and available for the nation's war transportation movements."

On grain shipments consigned for storage at Minneapolis, Minn., St. Paul and Duluth, and Superior, Wisc., and Itasca, permits will be required from the Northwest Grain Storage Committee. There will be similar requirements at other markets when the local grain storage committees complete their organization for the regulation of movements to the terminal points under their control.

## ODT Order No. 1 Further Modified

Blanket restrictions on the use of closed freight cars in any kind of intra-terminal freight movement, recently imposed by an amendment to General Order No. 1, have been modified by the Office of Defense Transportation to apply only to l. c. l. merchandise where such traffic can be conveniently handled by motor vehicle.

The new amendment (No. 2) specifies that, with certain exceptions, no carrier may load or forward between points in the same municipality, or between contiguous cities, or within adjacent zones, "any railway closed freight car containing merchandise." The exceptions provide that closed freight cars may be used: (a) where necessary to relieve freight house facilities because of inability to obtain transportation by motor vehicle; (b) where motor vehicles are not available; (c) where carrier, shipper or consignees' facilities make motor transport impracticable, and then only if such car contains the net tonnage demanded by the general order; (d) where authorized by special or general permit of ODT.

The new amendment provides for records and reports of all cars loaded under the exceptions, and the net tons carried.

The amendment was dated May 15, and announced in a May 19 statement which also had this to say: "Carloadings for the week ending May 9 showed 98,433 cars used in carrying less-than-carload freight, as compared with 162,887 for the comparable week last year. The reduction of 64,454 in the number of cars used for merchandise traffic represents a savings of 40 per cent, largely attributable to the effects of General Order No. 1."

A couple of days later the ODT issued General Permit No. 1 allowing the railroads to use closed freight cars for shipments from any depot, warehouse or other facility of the Army, Coast Guard, Marine Corps, or Navy of the United States to points in the same municipality, or between contiguous cities, or within adjacent zones.

## Army Puts Air Lines on Wartime Basis

Acting upon instructions issued by President Roosevelt, the War Department last week took steps to place domestic air lines "upon a wartime footing." The plan, according to War Department announcement, contemplates utilization of the commercial air fleet in three separate ways, as follows: A substantial proportion of the available flight equipment will be transferred outright to the Army Air Force to be available for operation by army personnel in the various services and commands; the air lines will convert approximately 70 planes into cargo carriers, title to most of which will remain in the companies, to be operated by air-line personnel under contract for the Air Service Command; and the remaining planes, aggregating about half of those now in commercial service, will until further notice continue to be owned and flown by the air lines, but will be considered always available for military missions.

"All routes and services not regarded as essential to the war program will be terminated," the announcement continued. "Air travel vital to the country's needs will continue, subject to a strict system of priorities to be enforced through agencies in various centers in different parts of the country. All persons who can travel by train are to do so, except in real emergencies. Merely because an individual is a member of our armed forces, or is engaged in war work, will not, in itself, entitle him to the use of air transport. While air mail will be flown for the present over the new routes to be operated by the air lines, it may become necessary to curtail this service still more at a later date."

Commenting on the foregoing at his May 15 press conference President Roosevelt said that the Army needed all the planes it could get; and he went on to observe that many people have been traveling by plane who could just as well travel by train. The latter prompted an inquiry as to whether it justified an inference that there is no shortage of rail passenger service, which will require rationing. The President replied that he didn't think the situation yet calls for the rationing of rail travel, although he added that, if it is necessary, it will be done. Meanwhile, Mr. Roosevelt suggested, there will perhaps be a natural curtailment in rail travel in that fewer people will be making train trips this summer—just as there will be fewer making automobile trips.

## Eastman Clarifies Procedures for Local-Transport Program

Letters clarifying the procedure to be followed in setting up and operating local plans under the nationwide transportation program have been sent out by Director Eastman, the Office of Defense Transportation, to the mayor of all cities, towns, and boroughs with a population of 10,000 or more.

Mr. Eastman said he had received "many gratifying assurances of cooperation" from the chief executives of municipalities throughout the country but that the responses had indicated "quite clearly a lack of understanding insofar as the nature of the national organization is concerned."

The Highway Traffic Advisory Committee to the War Department, Mr. Eastman explained, has assumed responsibility for the national operation of the program. J. Trueman Thompson, Willard building, Washington, D. C., has been named national director of the program, and a staff and field force have been assembled to assist him. Every governor, Mr. Eastman explained, is expected to appoint a committee to take charge of the program in each state, with the chairman acting as state administrator of the program. Mr. Thompson's staff will work through these state committees.

"It is highly desirable," Mr. Eastman said in his letter to the mayors, "that your local administrator keep in touch with the national program through the state administrator and his committee. These state organizations will be fully advised and equipped to render assistance to your local group, and from an organization standpoint it is advisable that your local administrators work through the state organization and not directly with the national office."

The purpose of the transportation program is (1) to prolong the life of all transportation facilities now in use and (2) to increase the efficiency of mass transportation facilities. These objectives are to be accomplished through (1) systematic staggering of office, factory, and school hours; (2) group riding in private automobiles on a planned, neighborhood-by-neighborhood basis, and (3) improved regulation of local traffic.

"The success of this plan depends largely

*Continued on next left-hand page*

upon the operation of your local group. I appreciate the cooperation thus far shown and earnestly request your continued full support."

The Office of Defense Transportation has sent copies of a manual containing detailed suggestions for setting up local war transportation programs to all Governors and to the mayors, burgesses, and other community executives.

### Safety Awards Presented

Winners of the Fifteenth Railroad Employees' National Safety Contest sponsored by the National Safety Council, were presented awards at a dinner at Chicago on May 18. The winners and the officers accepting the awards were as follows:

Group A: 50,000,000 or more man-hours; Chesapeake & Ohio, Geo. D. Brooke, president.

Group B: 20,000,000 to 50,000,000 man-hours; Norfolk & Western, C. H. Tabor, general manager.

Group D: 3,000,000 to 8,000,000 man-hours; Colorado & Southern, Robert Rice, vice-president.

Group E: 1,000,000 to 3,000,000 man-hours; New York, Susquehanna & Western, A. L. Kline, general manager.

Group F: Less than 1,000,000 man-hours; Pittsburg & Shawmut, W. W. Morrison, chief engineer.

PULLMAN COMPANY

Group G: Philadelphia Zone (Northern division); O. W. Snoddy, superintendent.

Group H: Calumet shops; Charles Gartelman, manager.

SWITCHING AND TERMINAL RAILROADS

Group A: Northern Pacific Terminal Co. of Oregon, not present.

Group B: The Saint Paul Union Depot Company, C. S. Christoffer, vice-president and general manager.

The lowest casualty rate established in 1941 was that of the Union Pacific of 2.78. Because rules of the contest prevent any railroad from receiving the award two years in succession, the Union Pacific was not eligible for the 1941 award. The next highest casualty rate was 4.41, that of the Chesapeake & Ohio. Notwithstanding an increase of 49.3 per cent in ton miles operated on this railroad, there was a 70 per cent reduction in the number of employees killed in 1941 as compared with the number killed in 1923, and during this 18-year period there has been an actual cumulative saving of 291 employee lives, or more than 16 lives per year. The casualty rate of the Norfolk & Western was 3.48.

Prior to the presentation of awards by John Stilwell, president of the National Safety Council, Henry T. Heald, president of the Illinois Institute of Technology, addressed the meeting on "What Shall We Do About Manpower." He called attention to the need for proper training of employees in safety to preserve labor supply, and briefly outlined how universities and others are co-operating with the government in the training of employees for war work by establishing specialized courses designed to train men in a matter of weeks, as compared with longer periods required under standard educational courses.

# Supply Trade

**F. B. Davis** has been appointed to manage sales of Aristoloy alloy steels and Coppco tool steels in the Buffalo, N. Y., district for the **Copperweld Steel Company.** Mr. Davis was previously connected with the Edgar T. Ward Company.

**The Cincinnati Milling Machine Company** and the **Cincinnati Grinders, Inc.,** will on June 1 serve their customers in New York state and New England through their sales subsidiary, the Cincinnati Milling & Grinding Machines, Inc., with district offices located in New York, Hartford, Conn., Boston, Mass., and Buffalo and Syracuse, N. Y. Henry Prentiss & Co., who have acted as the companies' exclusive dealer in New York state and New England since 1887, have announced their retirement from business on May 31.

**A. F. Allen,** secretary-treasurer and a director of the **American Steel & Wire Co.,** is retiring after more than 52 years of service with subsidiary companies of the United States Steel Corporation. His association with the wire company dates back to its formation. Mr. Allen was born in Cedar Rapids, Iowa, in 1872. He began his career with the Chicago & Northwestern in 1887, as a clerk in the foreman's office, later being promoted to clerk in the assistant superintendent's office. In June, 1890, he joined the Illinois Steel Company, which later became a subsidiary of the U. S. Steel Corporation, working in the purchasing, treasurer's and secretary's offices at Chicago. He became associated with the American Steel & Wire Co. in January, 1899, starting as a clerk in the secretary's office and in 1900 became assistant treasurer and the following year also assistant secretary. He was elected secretary in 1901, and treasurer in 1928.

### OBITUARY

**Charles Abercrombie Sims,** president of the Sims Construction Company of Philadelphia, Pa., died on May 13 after a brief illness. Mr. Sims was born in Memphis, Tenn. He began his career in the engineering department of the Pennsylvania railroad in 1882. Subsequently he was placed in charge of the construction of a railroad in West Virginia. In 1886 he returned to the Pennsylvania as an assistant engineer. Soon afterward Mr. Sims organized a railroad contracting company, and while engaged in this field he built a number of large railroad structures, including the four-track bridge of the Pennsylvania across the Delaware river.

### Navy "E" Burgee Awarded Nordberg

The Navy "E" burgee was presented to the Nordberg Manufacturing Company, Milwaukee, Wis., by the Navy on May 15 for production achievements. The presentation was made by Rear Admiral W. H. P. Blandy, chief of the Bureau of Ordnance, and was accepted by Robert E. Friend, president of Nordberg. Employees were presented Navy "E" emblems by Captain H. A. Spanagel, of the U. S. Naval Gun Factory, Navy Yard, Washington.

# Construction

BALTIMORE & OHIO.—This company has awarded a contract for grading work at Cincinnati, Ohio, involving an expenditure of $62,000, to C. F. Englehart of Johnstown, Pa.

GREAT NORTHERN AND SPOKANE INTERNATIONAL.—These two roads are constructing lines to a naval training station being built in northern Idaho.

LOUISVILLE & NASHVILLE.—The L. & N. has several construction projects under way, each of which will cost more than $20,000, as follows: Improving yard facilities, cooling facilities and the construction of a second main line track at Flomaton, Ala.; the construction of additional tracks at Alabama City, Ala.; and the construction of a second track between Higgins, La., and Gentilly.

MICHIGAN CENTRAL.—The Michigan State Highway Department, Lansing, Mich., has awarded a contract amounting to $94,000 to the American Bridge Company, Detroit, Mich., for the fabrication of 743 tons of structural steel for a grade separation carrying two tracks of the Michigan Central over U. S. Highway No. 112 near the Ford Bomber Plant at Willow Run, Mich. The bridge will consist of four double-track girder spans on reinforced concrete piers and abutments, crossing the highway on a skew of 37 deg. 20 min. The bridge will have a reinforced concrete slab floor and a ballasted deck. The center span will provide two clear openings of 40 ft. for the roadway and the approach spans will provide clear openings of 29 ft. The general contract for the construction has not been awarded.

MICHIGAN GRADE SEPARATION.—The State Highway Department, Lansing, Mich., has awarded a contract amounting to $130,959 to Walter Toebe & Co., Lansing, for the construction of two grade separation structures, each carrying one of two lanes of relocated U. S. Highway No. 112 over the Ford Motor Company spur tracks leading to the Willow Run plant. Each bridge will consist of three continuous reinforced concrete T-beam spans providing a 44-ft. roadway and two 1-ft. 3-in. curbs. One bridge will be 154½ ft. long and the other 139 ft. long. The contract also includes the removal of 1,900 ft. of spur trackage and the laying of 2,300 ft. of spur track. All ballast and track material will be furnished by the Ford Motor Company.

PITTSBURGH & LAKE ERIE.—Proposals will be received by this road at the office of the chief engineer, Pittsburgh, Pa., for the furnishing of material for the construction of the substructure and for the furnishing and erecting of structural steel for the superstructure of Raccoon Creek bridge, Ohio River branch, near Josephtown, Pa.

WABASH.—The Bethlehem Steel Company, Detroit, Mich., with a bid of $34,947,

# RAILROADS MEET THE CHALLENGE

BALTIMORE & OHIO — 5400-Hp. Diesel Freight Locomotive

## General Motors Diesel Freight Locomotives

### Are Contributing Many Important Advantages

IN America's Victory Program, the railroads rank equal in importance with the Army, Navy and Air Corps, and of all the indispensable war activities, *transportation* is the most far-reaching and must be kept in balance with production at all times. *Transportation* enters every stage of production from the time raw materials leave the ground until the finished products reach their final destinations. Men, planes, ships, tanks, guns, shells, bombs, as well as that great army of workers in war production plants, would all be useless without *transportation*.

The continuous increase of war tonnage has created a locomotive situation which is extremely critical. To meet this emergency, every available locomotive has been pressed into service, with the result that all serviceable reserve motive power has become totally absorbed.

This is a war of production. Ordinary production is not sufficient.

The momentous task, which now fronts American industry, is to produce more and more war materials and speed their delivery. This means that all facilities must be used to the maximum of their capabilities and with utmost economy.

Economy in the use of the nation's resources—making every pound of essential materials go as far as possible—is the conservation program which is vital to Victory.

Fortunate are the railroads using General Motors Diesel Road Locomotives, for in them lie the many important advantages (described in the following pages), particularly the release of heavy steam power for other services and the conservation of vital materials.

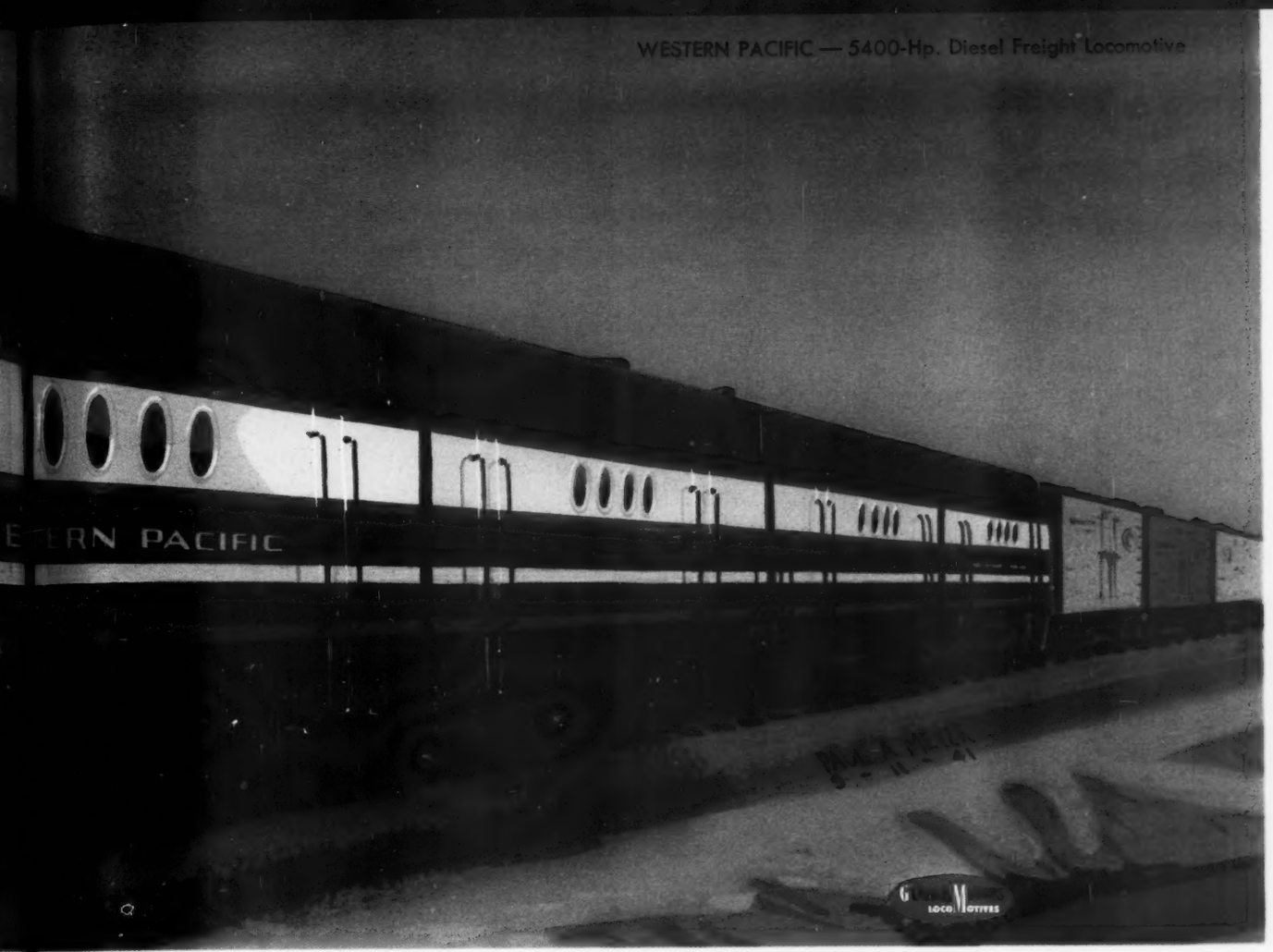
***No Job Is Being Better Done Today Than By American Railroads.***

**WHO SERVES THE RAILROADS—SERVES AMERICA**

## ELECTRO-MOTIVE DIVISION

GENERAL MOTORS CORPORATION LA GRANGE, ILLINOIS, U.S.A.

**GENERAL MOTORS** DIESEL FREIGHT LOCOMOTIVES PROVIDE: INCREASED



SED NNAGE HAULING CAPACITY REDUCTION IN TRAIN MILES AS MUCH AS 50 PERCENT FASTE

FASTER SCHEDULES FEWER SERVICE DELAYS GREATER AVAILABILITY.

TY.

RELEASE FOR OTHER IMPORTANT SERVICES AS MANY AS FIVE HEAVY STEAM LOCOMOTIVES FOR EACH DIESEL LOCOMOTIVE OPERATED.

INCREASED CARRYING CAPACITY OF EXISTING TRACK FACILITIES WITHOUT EXPENSIVE
CONSERVATION OF VITAL MATERIALS— ONE TON OF MATERIALS IN A GM DIESEL LOCOMOTIVE WI

ENSIVE REPLACEMENTS WITH HEAVIER RAIL OR REBUILDING OF BRIDGE STRUCTURES.
TIVE WILL DO THE WORK OF MORE THAN TWO TONS OF MATERIALS IN A STEAM LOCOMOTIVE.

## GM DIESEL FREIGHT LOCOMOTIVES

IN SERVICE AND ON ORDER

*BALTIMORE & OHIO RAILROAD
*BOSTON AND MAINE RAILROAD
GREAT NORTHERN RAILWAY
THE MILWAUKEE ROAD
*NORTHERN PACIFIC RAILWAY
DENVER & RIO GRANDE WESTERN
*ROCK ISLAND RAILWAY
SANTA FE RAILWAY
SEABOARD RAILWAY
SOUTHERN RAILWAY
WESTERN PACIFIC RAILROAD
*"XYZ" RAILROAD

*ON ORDER

# ELECTRO-MOTIVE DIVISION

GENERAL MOTORS CORPORATION LA GRANGE, ILLINOIS, U. S. A.

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was the low bidder for the fabrication of 281 tons of steel for the construction of a grade separation project to carry two tracks of the Wabash over Chase road at French Landing east of Ypsilanti, Mich. The bridge will consist of two girder spans on a reinforced concrete pier and abutments, crossing the highway at a skew of 50 deg., and will have a reinforced concrete slab floor carrying two ballasted tracks. Each span will provide a clear opening of 43 ft. for the highway. Bids have not been received for the general construction contract.

# Equipment and Supplies

## LOCOMOTIVES

THE WESTERN MARYLAND has ordered three 660-hp. Diesel-electric locomotives from the Baldwin Locomotive Works.

THE CHICAGO & EASTERN ILLINOIS has ordered one 600-hp. Diesel-electric locomotive from the Baldwin Locomotive Works.

THE BOSTON & MAINE has placed an order for six Diesel-electric freight locomotives of 5,400 hp. each with the Electro-Motive Corporation.

THE MINNEAPOLIS, NORTHFIELD & SOUTHERN has ordered one 660-hp. Diesel-electric locomotive from the Baldwin Locomotive Works.

THE ST. LOUIS-SAN FRANCISCO has ordered five 1,000-hp. Diesel-electric locomotives from the Baldwin Locomotive Works.

THE NEWBURGH & SOUTH SHORE has ordered two 660-hp. Diesel-electric locomotives from the American Locomotive Company.

THE PEORIA & PEKIN UNION has ordered one 1,000-hp. Diesel-electric locomotive from the American Locomotive Company.

## FREIGHT CARS

THE BESSEMER & LAKE ERIE is reported to have placed an order for 800 hopper cars of 90 tons' capacity with the Pullman-Standard Car Manufacturing Company. The inquiry for this equipment was reported in the *Railway Age* of March 28.

## SIGNALING

THE NEW YORK, NEW HAVEN & HARTFORD has placed an order with the Union Switch & Signal Co. covering three Model 31 electro-pneumatic double-rail car retarders for installation in the Cedar Hill, Conn., classification yards. Each of these retarders will be 68 ft. 8 in. long, comprising a total of 412 rail-feet of retardation, with each unit equipped with two control valves operated from two control levers.

THE ALTON & SOUTHERN has placed an order with the Union Switch & Signal Co. covering the materials for automatic crossing protection at a double-track crossing with the Terminal Railroad near Monsanto, Ill. Searchlight dwarf signals are being used with all instrument cases and relay houses that are to be factory wired before shipment. The field installation work will be done by the regular signal construction forces of the railroad company.

## WPB Releases 3,304 New Trucks and Trailers

During the week ended May 16, the War Production Board released 3,304 trucks and truck trailers and 227 miscellaneous vehicles under its truck rationing program, the Automotive Branch announced on May 18.

Since the program began March 9, a total of 28,100 trucks and truck trailers and 2,238 miscellaneous vehicles, including station wagons, hearses, ambulances, etc., have been released.

Last week, WPB released 333 light, 984 medium and 472 heavy trucks, 207 truck trailers and 33 miscellaneous vehicles for civilian use. At the same time, it released 615 light, 417 medium and 152 heavy trucks, 124 trailers and 194 miscellaneous vehicles on government exemption permits, which includes exports by both government and private agencies.

Since March 9, 12,316 vehicles of all types have been released for civilian use, and 18,022 on government exemption permits, making a total of 30,338, the announcement stated.

## Revised Priority Form

A revised form of application for priority assistance under the War Production Board's Requirements Plan to be used for the third quarter of 1942 has been announced by J. S. Knowlson, WPB's Division of Industry Operations.

New instructions to applicants for preference ratings under the Production Requirements Plan will allow them to omit a considerable part of the information which has previously been required. Users of materials will also be able to supply the same reports on PRP applications which they are now preparing in answer to the general metals questionnaire, Form PD-275.

The new instructions will simplify the preparation of PRP applications by the many additional companies which must begin operating under the Production Requirements Plan in the quarter starting July 1. In accordance with policy recently announced, most of the limited blanket ratings under which preference ratings have been assigned on an industry-wide basis will be revoked or allowed to expire, and companies which have been using the blanket ratings will be required to apply under PRP.

Under the new program, assignment of ratings to PRP applicants will depend increasingly on the nature and use of the applicant's product, less on the pattern of preference ratings on the orders which he has on his books. For example, high ratings would be assigned to a manufacturer of parts which would ultimately be incorporated in military planes or tanks, without his having to prove that 75 per cent of his orders were A-1-a, 15 per cent A-1-b, etc.

## Suppliers May Now Ship Processed Parts to Car Builders

The War Production Board last week made clear that freight car producers may accept deliveries of parts and materials from suppliers if they are not subject to other rated orders, despite the fact that all preference ratings of A-2 or lower assigned to freight car producers were recently cancelled.

Amendment No. 1 to Supplementary General Limitation Order L-97-a-1 clarifies the original order issued April 29, which prohibited producers from accepting delivery of material for car construction on orders rated A-2 or lower which was not in transit to them on that date. The amendment provides that suppliers may dispose of inventories of processed or partly-fabricated parts, if deliveries can be made to producers as on unrated orders.

Under the terms of the amendment, any producer or supplier may sell or deliver to any other producer or supplier or to a railroad any parts manufactured from materials obtained under a preference rating. "This," said the WPB announcement, "will permit balancing of inventories, and will assure maximum utilization of inventories. The original order gave this sale and exchange privilege to producers only."

## WPB Relaxes Control Over Used Rail

The War Production Board has relaxed its control over shipments of relay railroad rail, reroll and scrap rail so that small quantities of used rail may be disposed of without authorization, it was announced this week.

Amendment No. 1 to Limitation Order L-88 permits any person to sell, transfer, or otherwise dispose of not more than 10 tons of used rail during any calendar month. L-88 had halted all shipments, but it is now considered desirable to permit deliveries or sale of small quantities of scrap and other used rail.

At the same time, the amendment removed High Tee rail from the terms of the original order, thus permitting free disposal of this type of rail. High Tee rail is used largely by street car companies, and is not suitable for relaying by a railroad, it was explained.

Communications concerning used rail of the type suitable for relaying should continue to be addressed to the WPB's Transportation Equipment Branch, and communications concerning used rail of only reroll or scrap grade should be addressed to the Scrap Unit of WPB's Iron and Steel Branch, the announcement said.

*Continued on second left-hand page*

# Serving the Nation and

## FIRST IN WAR

A Twelve-Inch Rifle Casting of the 80s. This Big Gun had a Range of About Two Miles, Something Sensational in Those Days.

IN 1781, the year which records the surrender at Yorktown, Va. and the victorious conclusion of our nation's first war, Cyrus Alger founder and predecessor of the HUNT-SPILLER MFG. CORPORATION was born at Bridgewater, Mass.

The son of a foundryman, he naturally took up his father's trade. In 1810 he established Algers Foundry which specialized in ordnance work. Delving deep into the fundamentals of metallurgy he produced a metal having three times the strength of ordinary iron, something in those days of tremendous value in the manufacture of cannon and heavy artillery.

# ...d Industry Since 1810

# VITAL IN PEACE

Cannon balls, howitzers and large caliber guns manufactured in the early HUNT-SPILLER MFG. plant played a vital part in the victories of all the nation's wars from 1812 on. In other words "Gun Iron" was one of the vital materials serving our country in its early struggles.

An outstanding example of the wear-resisting properties of *Air Furnace* GUN IRON is recorded in the ordnance records of 1842. An 11-inch rifle manufactured from this material fired 1959 rounds before it failed.

Cast iron guns passed out of use with the development of steel, but, not HUNT-SPILLER *Air Furnace* GUN IRON. Its wear-resisting properties proved to be of vital importance to many industries.

In the railway field HUNT-SPILLER *Air Furnace* GUN IRON has been associated with the development of the "iron horse" for nearly 100 years. It has long been acknowledged to be one of the greatest factors contributing to the efficiency and economy of locomotive operation.

H S G I parts help to maintain maximum efficiency, prevent waste of power and fuel, insure greater availability, reduce maintenance costs—and in marine service they will be found in the cylinders of many naval and merchant vessels, both steam and diesel, which are helping to win this war.

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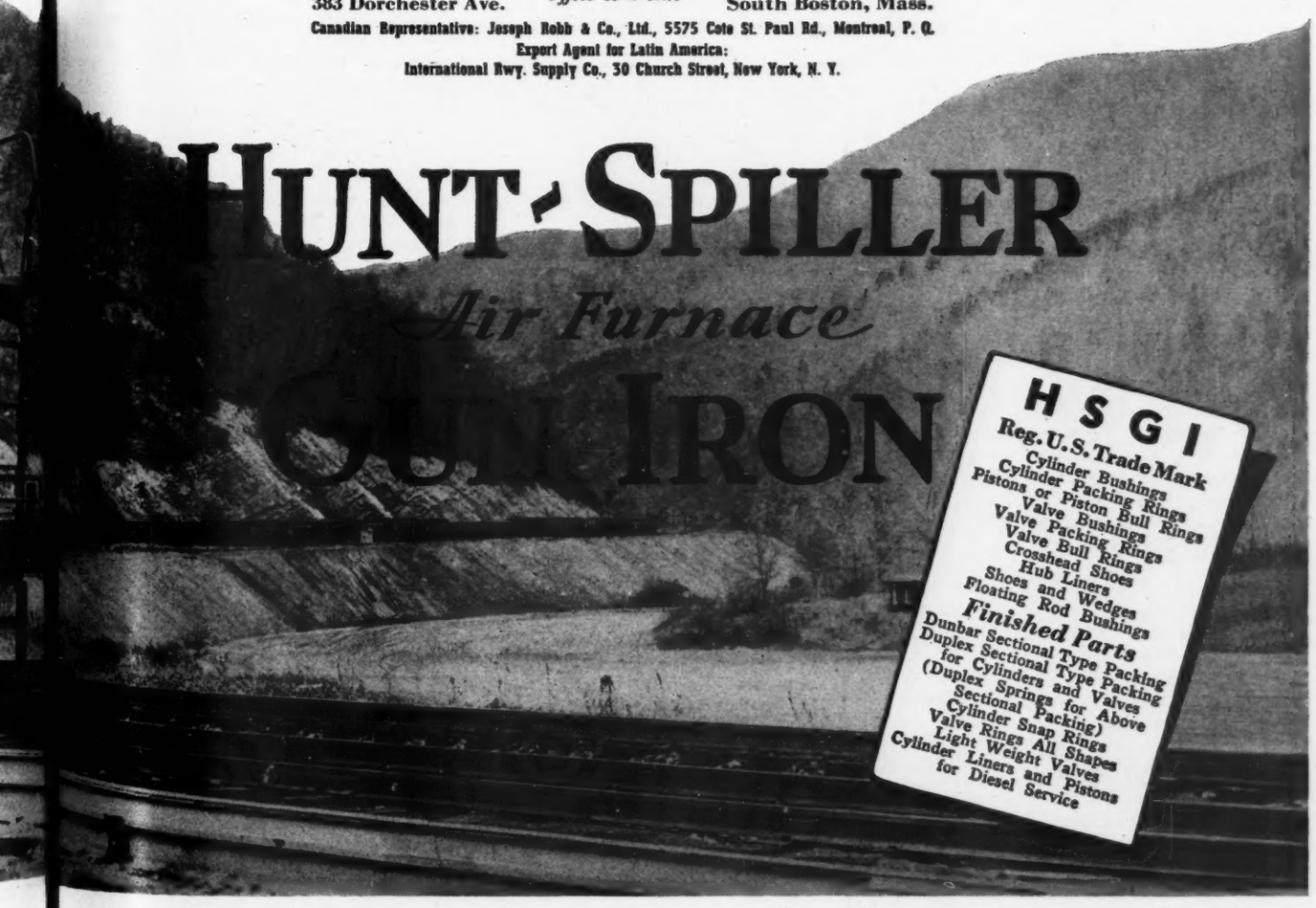

# Financial

BOSTON & MAINE.—*Abandonment.*—This company has asked the Interstate Commerce Commission for authority to abandon the following lines:

1. From Nashua, N. H., to Hudson, 2.2 miles, and

2. A portion of its Milford branch extending from a point 0.5 mile south of Milford, N. H., to the end of the line, 1.5 miles.

ERIE. — *Abandonment.* — This company would be permitted to abandon its ferry between Jersey City, N. J., and West Twenty-third St., New York City, two miles, if Division 4 of the Interstate Commerce Commission adopts a recommended report of its Examiner Ralph R. Molster.

ERIE.—*Acquisition.*—This company has asked the Interstate Commerce Commission for authority in connection with its reorganization to acquire the properties of the Northern of New Jersey including all of the issued and outstanding stock of the Nyack & Southern and to issue $957,862 of preferred stock, series A and 9,992 shares of common stock (or scrip for any or all of such preferred stock).

GULF, MOBILE & OHIO.—*Air Line Subsidiary.*—This company has filed an application with the Civil Aeronautics Board in Washington, D. C., for authority to provide air transportation service to territory served by its railway lines. Rebel Air Freight, Inc., a newly-organized subsidiary, plans to establish a main line mail-freight route from Chicago to New Orleans, La., serving St. Louis, Mo., Memphis, Tenn., Birmingham, Ala., Montgomery, Ala., and Mobile, Ala.

MINNEAPOLIS & ST. LOUIS.—*Bondholders Approve Plan.*—Sufficient holders of all classes of bonds, two-thirds or more in most instances, have approved the plan of reorganization according to Coverdale & Colpitts, reorganization manager. The plan now awaits a Federal Court order to become operative. Sale of the railroad's properties, which is the final legal step before the reorganization plan can be put in operation, has been postponed to July 24 from May 15. A minimum price of $2,010,000 has been fixed for bids by the United States District Court in Minneapolis, Minn. The railroad has been in receivership since 1923.

MINNEAPOLIS, ST. PAUL & SAULT STE. MARIE.—*Annual Report.*—The 1941 annual report of this road shows a net deficit, after interest and other charges, of $4,162,636, compared with a net deficit of $4,428,799 in 1940. Selected items from the income statement follow:

| | 1941 | Increase or Decrease Compared With 1940 |
|---|---|---|
| RAILWAY OPERATING REVENUES | $19,731,911 | +$2,594,333 |
| Maintenance of way and structures | 3,481,240 | +545,705 |
| Maintenance of equipment | 3,470,755 | +787,988 |
| Transportation | 7,432,759 | +722,958 |
| TOTAL OPERATING EXPENSES | 15,500,031 | +2,140,596 |
| Operating ratio | 78.55 | +.60 |
| NET REVENUE FROM OPERATIONS | 4,231,880 | +453,737 |
| Railway tax accruals | 1,464,717 | +191,371 |
| Railway operating income | 2,767,163 | +262,366 |
| Net Rents—Dr. | 453,593 | −14,925 |
| NET RAILWAY OPERATING INCOME | 2,313,569 | +277,291 |
| Other income | 147,365 | +4,084 |
| TOTAL INCOME | 2,460,934 | +281,375 |
| Rent for leased roads | 1,440 | −5 |
| TOTAL FIXED CHARGES | 6,606,813 | +10,059 |
| NET DEFICIT | $4,162,636 | −$266,163 |

MISSOURI-KANSAS-TEXAS. — *Pledge of Collateral.*—Division 4 of the Interstate Commerce Commission has modified its order of December 4, 1922, in Finance Docket No. 1250 so as to authorize this company to pledge from time to time, to and including December 30, 1944, any of the $52,942,752 of prior lien mortgage five per cent gold bonds, series A, and $27,236,000 of prior-lien mortgage four per cent gold bonds, Series B, which it may purchase and deposit as additional security for loans totaling $2,714,239 from the Reconstruction Finance Corporation.

At the same time Division 4 has modified its order of December 29, 1927, in Finance Docket No. 6623 so as to permit this company to pledge from time to time to and including December 30, 1944, as additional security for loans from the RFC totaling $2,714,239, $13,600,000 of prior lien mortgage 4½ per cent gold bonds, series D.

MISSOURI PACIFIC.—*Abandonment by the San Benito & Rio Grande Valley.*—The San Benito & Rio Grande Valley has asked the Interstate Commerce Commission for authority to abandon the following lines:

1. From Ohio Junction, Tex., to Boulevard Junction, 6.4 miles;

2. From Rio Hondo, Tex., to La Leona, 9.3 miles; and

3. From La Paloma, Tex., to Santander, 5.9 miles.

MISSOURI PACIFIC. — *Equipment Trust Certificates.*—Because of a shortage of equipment due to the war needs, this company has been authorized by Division 4 of the Interstate Commerce Commission to substitute in Finance Docket No. 13481 100 50-ton, 50-ft. all-steel flat cars and 238 50-ton, 40-ft. 6 in. all-steel box cars for 50 covered cement hopper cars and 200 automobile cars. The estimated cost of the new equipment is $1,053,909 as contrasted with $981,167 for the equiment which the company is unable to obtain.

NEW JERSEY & NEW YORK.—*Abandonment.*—This company has asked the Interstate Commerce Commission for authority to abandon a part of its Haverstraw branch extending from Stony Point Junction, N. Y., to the end of the branch at Haverstraw, 2.2 miles.

NASHVILLE, CHATTANOOGA & ST. LOUIS. —*Annual Report.*—The 1941 annual report of this road shows a net income, after interest and other charges, of $1,888,517, compared with a net income of $703,444 in 1940. Selected items from the income statement follow:

| | 1941 | Increase or Decrease Compared with 1940 |
|---|---|---|
| Average Mileage Operated | 1,110.90 | +.13 |
| RAILWAY OPERATING REVENUES | $19,668,767 | +$4,036,133 |
| Maintenance of way and structures | 1,951,830 | +304,374 |
| Maintenance of equipment | 3,267,310 | +355,061 |
| Transportation | 7,355,952 | +1,238,308 |
| TOTAL OPERATING EXPENSES | 14,128,157 | +1,978,264 |
| Operating ratio | 71.83 | −5.89 |
| NET REVENUE FROM OPERATIONS | 5,540,610 | +2,057,870 |
| Railway tax accruals | 1,855,540 | +754,168 |
| Railway operating income | 3,685,070 | +1,302,701 |
| Equipment rents—Dr. | 563,549 | +84,824 |
| Joint facility rents | 187,897 | +22,115 |
| NET RAILWAY OPERATING INCOME | 3,309,419 | +1,239,993 |
| Non-operating income | 189,350 | +6,969 |
| GROSS INCOME | 3,498,768 | +1,246,962 |
| Rent for leased roads | 804,404 | ..... |
| Interest on funded debt | 727,619 | +40,289 |
| TOTAL DEDUCTIONS FROM GROSS INCOME | 1,610,252 | +61,889 |
| NET INCOME | $1,888,517 | +$1,185,073 |

NEW YORK CENTRAL.—*Securities Corporation Liquidated.*—In its annual report for 1941, company states that in November, 1941, it took over the assets of its wholly-owned subsidiary, the Securities Corporation, which was dissolved. These assets consisted principally of shares of the Delaware, Lackawanna & Western, acquired in 1929-1931 at cost of $17,294,882 in connection with the so-called four-party plan of consolidation of eastern railroads, under which the Lackawanna was assigned to the New York Central system; and advances in connection with the acquisition of stock of the United States Freight Company, a large freight-forwarding company, acquired in 1929-1931 at cost of $14,843,248. The difference between the company's investment in the Securities Corporation and the current estimated market value of the assets taken over, amounting to $26,842,643, was charged to profit and loss.

NEW YORK, ONTARIO & WESTERN.—*Acquisition.*—This company has been authorized by Division 4 of the Interstate Commerce Commission to purchase the steam railroad properties of the Utica, Clinton & Binghamton, extending from Randallsville, N. Y., to Utica, 31.1 miles. At the same time the company was authorized to modify a sub-lease of the properties of the Rome & Clinton. The New York, Ontario & Western will pay $250,000 for the property, making payments of $25,000 a year over a 10-year period.

NORFOLK & WESTERN.—*Abandonment.*—This company has been granted permission by Division 4 of the Interstate Commerce Commission to abandon a portion of its Narrows branch, extending from Bastian, Va., to Suiter, 4.2 miles.

ST. LOUIS-SAN FRANCISCO.—Abandonment.—This company would be authorized to abandon a line of railroad extending

from McNair, Ark., to Dills, Okla., 91.2 miles, if Division 4 of the Interstate Commerce Commission adopts a recommended report of its Examiner J. S. Prichard. The examiner points out that the abandonment of the line is necessitated by the construction of the Fort Gibson dam and reservoir which will inundate a part of the line and further by the fact that it has been operating at a deficit for some years.

SEABOARD AIR LINE.—*Abandonment.*—This company has asked the Interstate Commerce Commission for authority to abandon a branch line extending from Chisholm, S. C., southerly to Lancett, 3.5 miles.

SOUTHERN PACIFIC. — *Abandonment.* — This company has asked the Interstate Commerce Commission for authority to abandon 1.6 miles of its San Francisco-San Bruno branch in San Francisco, Calif.

SPOKANE INTERNATIONAL. — *Reorganization Costs.*—Division 4 of the Interstate Commerce Commission has fixed the final allowances for services of the various parties in connection with the reorganization of this company under section 77 of the Bankruptcy Act. The various committees and their counsel and the reorganization managers had claimed a total of $67,377, but Division 4 pared this figure down to $46,286.

WHEELING & LAKE ERIE.—*Annual Report.*—The 1941 annual report of this road shows a net income, after interest and other charges, of $3,554,277, compared with a net income of $3,959,629 in 1940. Selected items from the income statement follow:

| | 1941 | Increase or Decrease Compared with 1940 |
|---|---|---|
| Average Mileage Operated | 507.20 | ..... |
| RAILWAY OPERATING REVENUES | $21,221,641 | +$4,224,075 |
| Maintenance of way and structures | 2,598,632 | +550,891 |
| Maintenance of equipment | 4,010,058 | +616,980 |
| Transportation | 5,931,953 | +974,982 |
| TOTAL OPERATING EXPENSES | 13,517,799 | +2,213,633 |
| Operating ratio | 63.70 | –2.80 |
| NET REVENUE FROM OPERATIONS | 7,703,842 | +2,010,442 |
| Railway tax accruals | 5,293,070 | +2,820,401 |
| Railway operating income | 2,410,772 | –809,960 |
| Net rents—Cr. | 1,561,670 | +437,668 |
| NET RAILWAY OPERATING INCOME | 3,972,442 | –372,292 |
| Other income | 153,209 | –16,480 |
| TOTAL INCOME | 4,125,651 | –388,772 |
| Interest on funded debt | 547,026 | +7,001 |
| TOTAL FIXED CHARGES | 549,169 | +8,450 |
| NET INCOME | $3,554,277 | –405,352 |

## Average Prices of Stocks and Bonds

| | May 19 | Last week | Last year |
|---|---|---|---|
| Average price of 20 representative railway stocks.. | 24.52 | 24.77 | 28.72 |
| Average price of 20 representative railway bonds.. | 66.02 | 67.43 | 64.96 |

# Railway Officers

## EXECUTIVE

**Elliott W. Springs,** president and traffic manager of the Lancaster & Chester, has been elected chairman of the board of directors and traffic manager, with headquarters as before at Lancaster, S. C. **A. P. McLure,** vice-president, general manager and auditor, has been elected president and general manager, succeeding Mr. Springs as president. **H. R. Rice,** secretary and treasurer, has been elected vice-president, secretary and treasurer, succeeding Mr. McLure as vice-president. **J. U. Bell,** assistant auditor, assistant general manager and general freight agent, has been elected auditor and general freight agent, succeeding Mr. McLure as auditor.

**N. R. Crump,** assistant superintendent of motive power of the Canadian Pacific at Winnipeg, Man., has been promoted to assistant to the vice-president at Montreal, Que. **Alex Lyle,** chief clerk to vice-president at Montreal, has been promoted to assistant to the vice-president at Montreal. Mr. Crump was born at Revelstoke, B. C., on July 30, 1904, and attended the public schools of Revelstoke and Vancouver, receiving his B.Sc. and M. E. degrees from Purdue University, Lafayette, Ind., in 1929. Mr. Crump entered railroad service with the Canadian Pacific in 1920 as a machinist apprentice at Field, B. C., transferring to the Weston shops at Winnipeg two years later. He then attended Purdue University from 1925 to 1929, returning to Winnipeg as machinist. In 1930 Mr. Crump became night foreman at Sutherland, Sask., subsequently becoming shop foreman at Lethbridge, Alta., and Calgary, successively. He then served as locomotive foreman at Wilkie, Sask., night foreman at Moose Jaw, Sask., and division master mechanic there, being transferred to Regina, Sask., in 1936. In 1939 he was appointed chief mechanical draughtsman for Western lines at Winnipeg and in 1940 he became assistant superintendent of motive power for Western Canada, which position he held until his recent promotion.

N. R. Crump

Mr. Lyle was born in Scotland and went to Canada in 1910, joining the Canadian Pacific as a stenographer in the office of the general superintendent at Moose Jaw in September of that year. In April, 1912, he became secretary to the general superintendent at Vancouver, B. C., serving successively as clerk, senior clerk and acting chief clerk there. In May, 1927, Mr. Lyle became chief clerk to the assistant general manager, Western lines, at Vancouver and in January, 1930, he became chief to the vice-president, Western lines, at Winnipeg. In September, 1934, he was appointed chief clerk to vice-president of the system at Montreal.

Alex Lyle

## FINANCIAL, LEGAL AND ACCOUNTING

**Willis J. O'Brien,** attorney for the Chicago, Milwaukee, St. Paul & Pacific at Des Moines, Iowa, has been promoted to solicitor for the state of Iowa, with the same headquarters, succeeding **John N. Hughes,** who at his own request, has been relieved of general charge of the Milwaukee's legal business in Iowa, but will continue in service as a special attorney.

**R. Brady Williamson,** whose retirement on April 30 as freight claim agent of the Missouri Pacific, with headquarters at St. Paul, Mo., was reported in the *Railway Age* of May 16, entered railway service at the age of 12 as a waterboy. In 1906 he went with the Missouri Pacific as a division claim agent at Coffeyville, Kans., and in 1909 he was promoted to district claim agent at Kansas City, Mo. In 1914 he was appointed claim agent in the general manager's office and in October, 1919, he was promoted to superintendent of claim prevention, with headquarters at St. Louis. Mr. Williamson was advanced to freight claim agent, with the same headquarters, in November, 1921, which position he held until his retirement.

## OPERATING

**E. W. G. Chapman,** division engineer on the Canadian National at Edmundston, N. B., has been appointed acting superintendent of the Edmundston division, with the same headquarters, succeeding **J. L. St. Onge,** who has been appointed superin-

*Continued on next left-hand page*

tendent of the Laurentian division, with headquarters at Quebec, Que., to succeed **G. R. Edgley,** transferred. **R. B. Graham,** assistant superintendent at Moncton, N. B., has been appointed acting superintendent of the Moncton division, with the same headquarters. **J. H. Swetnam** has been appointed acting assistant superintendent of the Moncton division. **J. A. C. Michaud** has been appointed acting assistant superintendent of the Edmunston division.

**Edwin G. Kiesele,** whose promotion to superintendent of the Chicago terminals of the Chicago, Milwaukee, St. Paul & Pacific, with headquarters at Chicago, was reported in the *Railway Age* of May 9, was born at Dubuque, Iowa, on November 30, 1892, and entered railway service on June 24, 1907, as a clerk for the Milwaukee at Dubuque, later serving as a timekeeper, night yardmaster and general yardmaster at that point. During the First World War, he saw military service

**Edwin G. Kiesele**

in France and returned to the Milwaukee on October 20, 1919, as yardmaster at Dubuque. On May 5, 1928, Mr. Kiesele was promoted to trainmaster at Milwaukee, Wis., and from July 1, 1930, to January 11, 1937, he was assigned to other duties. On the latter date he was appointed trainmaster at Green Bay, Wis., and on December 16, 1937, he was transferred to Chicago. Mr. Kiesele was advanced to assistant superintendent at Chicago on March 1, 1939, which position he held until his recent promotion, effective May 15.

**Harry P. Congdon,** assistant to the executive vice-president on the Chicago, St. Paul, Minneapolis & Omaha, has been appointed general superintendent, with headquarters as before at St. Paul, Minn. **Parr A. Bloom,** assistant to the executive vice-president, has been appointed assistant to the vice-president-operations, a change of title, and **E. A. Vik,** assistant to the executive vice-president in charge of personnel, has been appointed director of personnel, also a change of title.

**H. H. Holmes** has been appointed trainmaster of the Peoria division of the New York, Chicago & St. Louis, with headquarters at Frankfort, Ind., and **C. W. Hecker** has been appointed trainmaster of the Indianapolis division, with headquarters at Peru, Ind.

**C. L. McGrain,** assistant superintendent of the Canadian division of the Pere Marquette, has been promoted to superintendent of that division, with headquarters at St. Thomas, Ont., succeeding **R. S. Black,** deceased. The position of assistant superintendent of the Canadian division has been abolished.

## TRAFFIC

**George E. Dove** has been appointed district freight representative of the Baltimore & Ohio, with headquarters at Jacksonville, Fla., succeeding **H. S. Smith,** promoted.

**J. F. Downs,** commercial agent for the Missouri Pacific at Sedalia, Mo., has been promoted to division freight and passenger agent, with the same headquarters succeeding **V. J. Kaiser,** who died on April 21.

**J. L. Henning,** traveling passenger agent for the Denver & Rio Grande Western at New York, has been promoted to general agent at Washington, D. C., succeeding **S. E. Mullikin,** who has entered military service.

**Carroll Black** has been appointed general agent for the St. Louis Southwestern, with headquarters at McGregor, Tex., a newly created position. Mr. Black will have jurisdiction over all traffic and operating department employees at McGregor and at the Blue Bonnet Ordnance plant.

**N. L. Richmond,** whose promotion to coal traffic manager of the Illinois Central, with headquarters at Chicago, was reported in the *Railway Age* of May 16, was born at Champaign, Ill., and attended the University of Illinois. He left the University to enlist in the U. S. Army in 1917 and saw two years of service in France with the Rainbow division. Upon his return, he entered railway service as a yard clerk on the Illinois Central at Champaign and during the next twelve years he held

**N. L. Richmond**

various positions in the operating department, after which he was transferred to traffic work in 1932 as city freight agent at Chicago. Later he served two years as coal freight agent in the southern Illinois coal fields, with headquarters at Carbondale, Ill., after which he became division traffic agent at Louisville, Ky., then being appointed office manager to the vice-president in charge of traffic at Chicago, which position he held until his recent appointment.

**D. W. Lang,** district freight agent on the Baltimore & Ohio at Columbus, Ohio, has been promoted to division freight agent at Chillicothe, Ohio, succeeding **L. E. C. Roehrig,** who has been transferred to Louisville, Ky., replacing **T. O. Pinaire,** deceased.

## ENGINEERING & SIGNALING

**G. E. Martin,** whose promotion to superintendent of water service of the Illinois Central, with headquarters at Chicago, was reported in the *Railway Age* of May 9, was born at Princeton, Ky., on December 9, 1898, and attended the University of Kentucky. He entered railway service on March 30, 1921, as a water

**G. E. Martin**

works helper on the Illinois Central at Princeton, Ky., and was promoted to repairman on August 16, 1922. On May 15, 1926, Mr. Martin was advanced to supervisor of water service of the Gulf & Ship Island (part of the Illinois Central system) and when that position was abolished on February 1, 1929, he returned to the Kentucky division as a water works repairman. On June 1, 1929, he was appointed motor car repairman at Princeton and on September 15, 1931, he was appointed water works repairman at Paducah. On May 1, 1932, Mr. Martin was promoted to water service foreman on the Kentucky division, with headquarters at Paducah, and on November 1, 1940, he was advanced to supervisor of bridges and buildings, with the same headquarters, which position he held until his recent promotion, effective May 1.

**Clarence Baker,** assistant division engineer on the Gulf Coast Lines (Missouri Pacific) at DeQuincy, La., has been promoted to principal assistant engineer of the Gulf Coast Lines and the International-Great Northern, with headquarters at Houston, Tex., succeeding **W. T. Alexander,** whose appointment as assistant chief engineer of the Texas & Pacific, with headquarters at Dallas, Tex., was reported in the *Railway Age* of May 16. Mr. Baker

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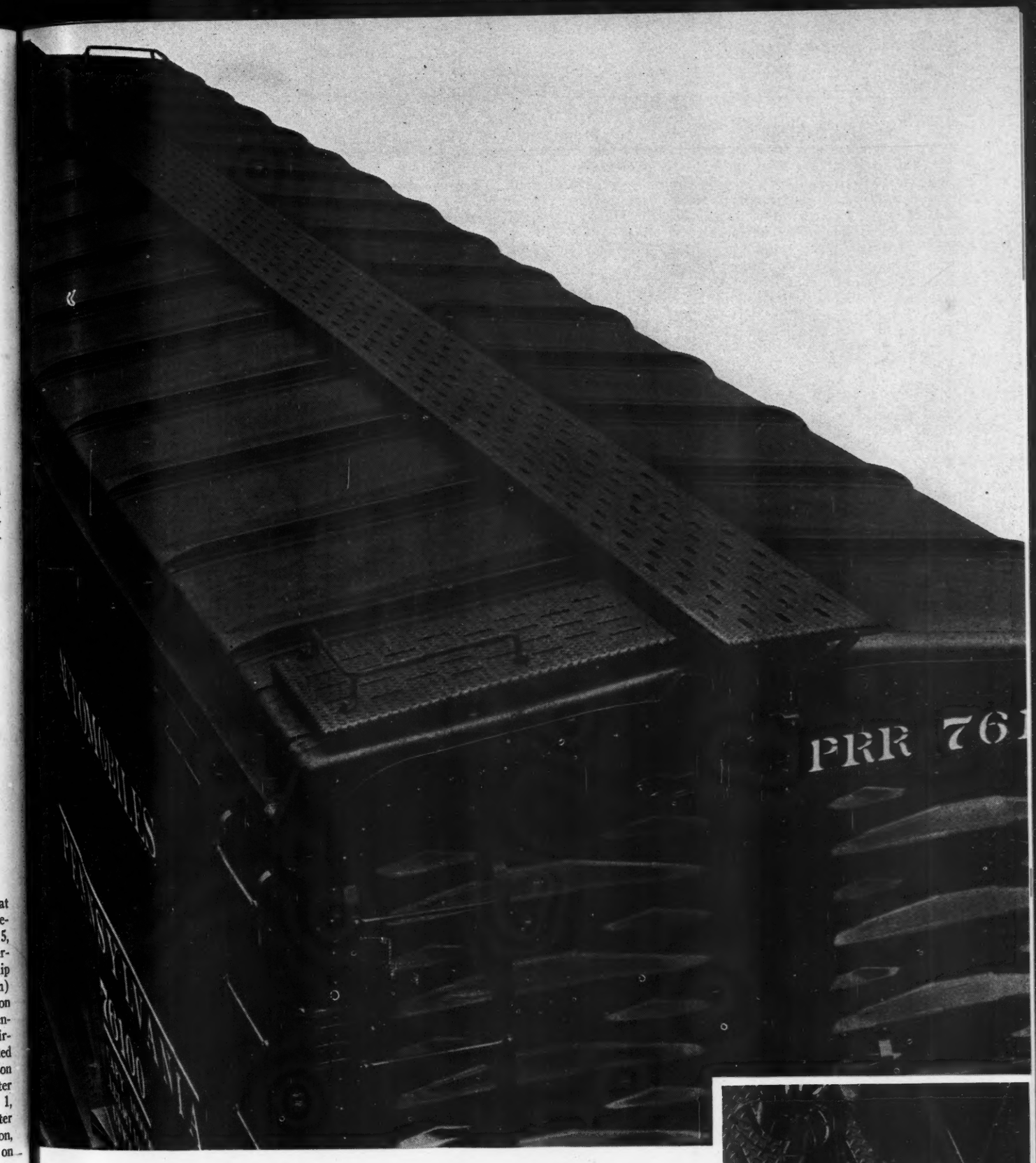


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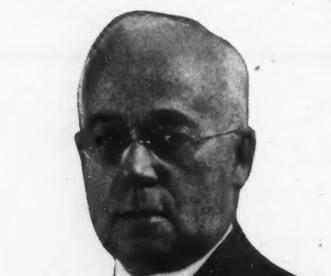
was born at Carbondale, Ill., on July 16, 1902, and graduated from Rice Institute, Houston, in 1924. He first entered railway service on June 1, 1922, serving as a chairman on the Missouri Pacific at Houston during a summer vacation from school and the following summer he worked as a gravel inspector. He entered permanent employment with the same road on June 4, 1924, as a transitman at Kingsville, Tex., and later served as a rodman at Edinburg, Tex., a transitman at Raymondville, Tex., and a resident engineer on construction at various locations in the Rio Grande Valley. On January 1, 1930, Mr. Baker was promoted to assistant engineer at Kingsville, Tex., and on June 1, 1940, he was appointed roadmaster at Harlingen, Tex. Three months later, he returned to Kingsville as assistant engineer and on March 9, 1942, he was advanced to assistant division engineer at De Quincy, the position he held until his recent promotion, effective May 8.

**William A. Duff,** engineer of bridges and roadway of the Canadian National, with headquarters at Montreal, Que., retired on May 15, in accordance with the pension regulations of the company. **Ross O. Stewart,** assistant engineer at Montreal, has been appointed engineer of bridges at Montreal. **John A. Ellis,** assistant engineer of roadway standards at Montreal, has been appointed engineer of track at Montreal. Mr. Duff was born in Wentworth county, Ont., and was graduated from the University of Toronto in 1901 in Applied Science. He entered railroad service in 1901 with the Vancouver, Victoria & Eastern (Great Northern) as draftsman and engineer, becoming assistant engineer for the Grand Trunk at Hamilton, Ont., the following year. From 1903 to 1907 Mr. Duff served as draftsman with various bridge companies and from 1907 to 1913 he was chief draftsman and assistant bridge engineer for the Transcontinental (Canadian National) at Ottawa, Ont. In 1913 Mr. Duff became bridge engineer for the Canadian Government Railways (Canadian National) at Moncton, B. C. and in 1916 he became assistant chief engineer. In 1920 he became engineer of standards of the Canadian National, becoming engineer of bridges and roadway in 1932, which position he held until his retirement.



William A. Duff

Mr. Stewart was born at Lindsay, Ont., and was graduated from the University of Toronto in Applied Science in 1910. He began his career in the engineering department of the Dominion Bridge Company and in 1913 he joined the Canadian Government Railways as assistant bridge engineer at Moncton, N. B. After the organization of the Canadian National, Mr. Stewart was appointed assistant engineer of standards, first at Toronto and then at Montreal. He subsequently served as engineer of bridge standards, assistant structural engineer and assistant engineer, holding the latter position at Montreal until his recent appointment as engineer of bridges.

Ross O. Stewart

Mr. Ellis was born at Arbroath, Scotland, and was graduated from the City and Guilds Technical College, London. He began his career as pupil assistant on construction on the Great Northern, Picadilly & Brompton Tube railway, after which he was with the former Great Northern, now part of the London & North Eastern. Then followed a period in India on construction and maintenance with the Oudh and Rohilkhund State Railway. Mr. Ellis went to Canada in 1911 and joined the Canadian Northern (Canadian National) on construction and location. A period of three years was spent with the Canadian Pacific on location and construction and in 1915 Mr. Ellis was appointed engineer of construction with the Canadian Government Railways at Moncton, later becoming office engineer there. In 1921 Mr. Ellis was appointed assistant engineer of roadway standards for the Canadian National at Toronto, later being transferred to Montreal.

John A. Ellis

## PURCHASES AND STORES

**N. L. Satchell,** storekeeper of the New York, Ontario & Western, at Middletown, N. Y., has been appointed general storekeeper.

**N. T. Womack** has been appointed assistant purchasing agent of the Texas & Pacific, a newly created position, with headquarters at Dallas, Tex.

**Arthur N. Crenshaw,** assistant purchasing agent on the Great Northern, with headquarters at St. Paul, Minn., has been promoted to purchasing agent, with the same headquarters, succeeding **Abner H. Lillengren,** who retired on account of illness on May 14. **H. B. Nordstrom** and **A. D. Sturley** have been appointed assistant purchasing agents at St. Paul, Minn. Mr. Crenshaw was born at Everest, Kan., on December 17, 1886, and entered railway service on July 5, 1905, in the office of the auditor of passenger accounts of the Union Pacific. On October 1, 1905, he was appointed a clerk in the purchasing department at Omaha, Neb., and on July 25, 1907, he went with the Great Northern as a clerk in the purchasing department at St. Paul. Mr. Crenshaw was promoted to assistant chief clerk on January 1, 1912, and to chief clerk on May 1, 1917. On February 1, 1919, he was appointed commissary buyer and on July 11, 1921, he was reappointed chief clerk of the purchasing department. On October 16, 1926, he was promoted to buyer, and on July 1, 1939, he was advanced to assistant purchasing agent, the position he held until his recent promotion.

Arthur N. Crenshaw

Mr. Lillengren was born in Stillwater, Minn., on July 20, 1877, and attended business college. He entered the service of the Great Northern as a clerk in the office of the auditor of passenger receipts in December, 1896, and in 1899 he transferred to the purchasing department. He left the Great Northern in October, 1911, to affiliate with a contracting business on the

*Continued on third right-hand page*

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| " | #13.24—1—43' deck girder span; 1—66' deck truss span | 100,324 " |
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| " | #16.64—1—40' thru girder span | 20,487 " |
| " | #18.33—2 span deck plate girder, each span 22' | 10,000 " |
| " | #23.92—1 span 45' deck plate girder | 30,600 " |
| " | #32.92—1 span 36' deck plate girder | 16,450 " |
| " | #36.56—1 span 62' deck plate girder | 53,460 " |
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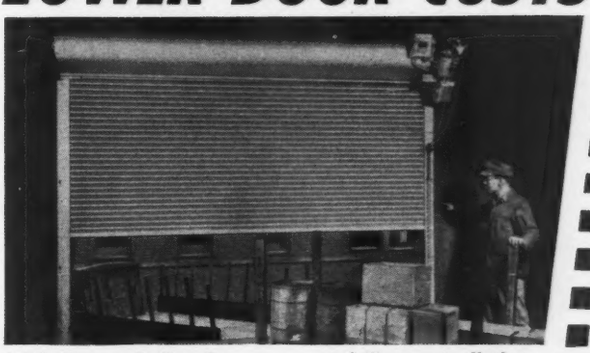

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